Vol. 1230 Number 3

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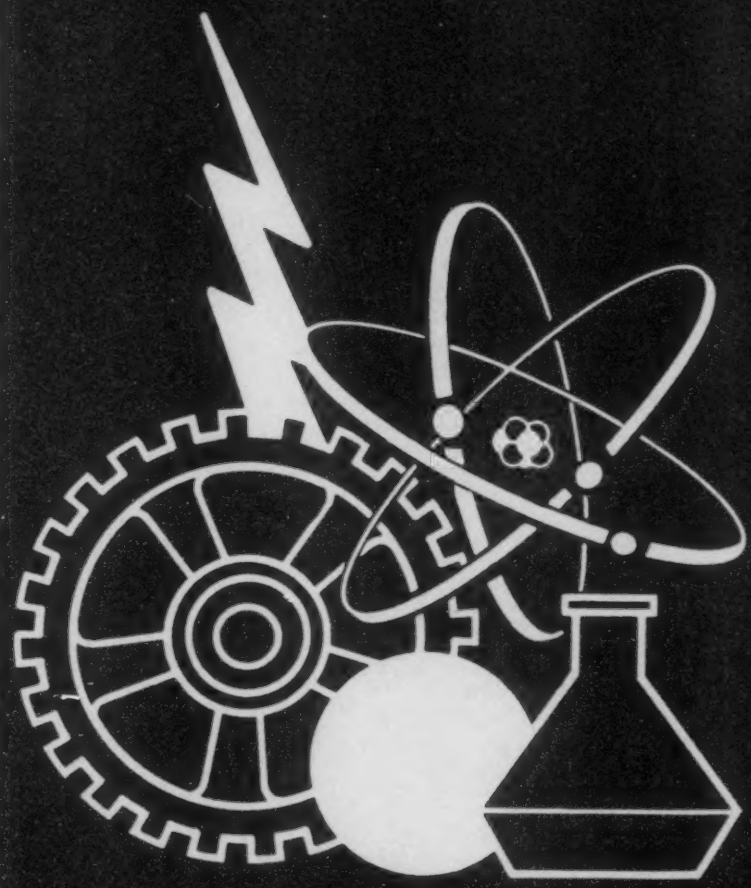
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

ute to:

PATENTS

January 18, 2000



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

January 18, 2000 Volume 1230 Number 3

CONTENTS

			Page
Patent and Trademark Office Notices			
Patent Cooperation Treaty (PCT) Information	1230	OG	59
Patent Cooperation Treaty (PCT) Update	1230	OG	60
Notice of Maintenance Fees Payable	1230	OG	61
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee	1230	OG	62
Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 12/03/99	1230	OG	68
Reissue Applications Filed	1230	OG	68
Requests for Reexamination Filed	1230	OG	69
Notice Regarding Technical Center Box Issue Fee Mailings	1230	OG	69
Registration to Practice	1230	OG	69
Financial Services Available Over the Internet	1230	OG	86
Certificates of Correction	1230	OG	86
Summary of Final Decisions Issued by the Trademark Trial and Appeal Board	1230	OG	87
Special Boxes for Mail	1230	OG	89
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1230	OG	91
Patent Technology Centers	1230	OG	93
Condition of Trademark Applications	1230	OG	95
Reexaminations			1887
Reissue Patents Granted (36,496)			1889
Plant Patents Granted (11,181)			1899
Patents Granted			
General and Mechanical (6,014,769)			1901
Chemical (6,015,439)			2125
Electrical (6,015,945)			2283
Design Patents Granted (418,963)			2491
Index of Patentees		PI	1
Indices of Reissue, Reexaminations, Design and Plant Patents		PI	88
Classification of			
Patents (Including Reissues and Reexaminations)		PI	101
Designs and Plants Applications		PI	104
Geographical Index of Residence of Inventors			
Patents (Including Reissues and Reexaminations)		PI	107
Designs and Plant Applications		PI	109
Change of Address Form		PI	111
Subscription Order Form		PI	113

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1225 O.G. 114, on August 31, 1999.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was decreased, effective January 1, 2000, and was announced in the *Official Gazette* at 1229 O.G. 4, on December 7, 1999.

International fees were changed, effective on January 1, 2000, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1229 O.G. 4, on December 7, 1999. A change in the maximum number of designation fees payable, with effect from January 1, 2000, was announced in the *Official Gazette* at 1229 O.G. 4, on December 7, 1999. A change in the reduction for electronic filing, with effect from January 1, 2000, was announced in the *Official Gazette* at 1229 O.G. 4, on December 7, 1999.

Certain domestic PCT fees have been changed by Public Law 106-113 of November 29, 1999, and were announced in the *Official Gazette* at 1229 O.G. 38, on December 14, 1999. The effective date of the fee change is December 29, 1999.

The schedule of PCT fees (in U.S. dollars), as of January 1, 2000, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	$240.00
Search fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	$700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a) and filing fee under 37 CFR 1.16(a) paid	$450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	$210.00
European Patent Office as ISA	$990.00
International fees	
Basic fee	$427.00
Basic supplemental fee (for each page over 30)	$10.00
Designation fee per country or region	
— For the first 8 national or regional offices designated	$92.00
— For each designation in excess of 8 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	$92.00
— Confirmation fee	$46.00

(A reduction of $132 in the international fees is available in certain cases where PCT-EASY software is used to prepare the request, provided that the necessary conditions are met. See 1217 OG 131 (December 29, 1998)).

International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	$153.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	$490.00
— Additional examination fee, per additional invention (payable only upon invitation)	$140.00
— USPTO was not ISA in PCT Chapter I	$750.00
— Additional examination fee, per additional invention (payable only upon invitation)	$270.00

U.S. National Stage fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	$48.00	$96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	$335.00	$670.00
USPTO was ISA but not IPEA	$345.00	$690.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	$485.00	$970.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	$420.00	$840.00
Other National fees		
— For each independent claim in excess of 3	$39.00	$78.00
— For each claim in excess of 20	$9.00	$18.00
— For each application containing a multiple dependent claim	$130.00	$260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	$65.00	$130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	$130.00	$130.00

Dec. 7, 1999

Q. TODD DICKINSON
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

Patent Cooperation Treaty (PCT) Update

Ratification by the People's Democratic Republic of Algeria

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that the the People's Democratic Republic of Algeria deposited its instrument of accession to the PCT on December 8, 1999. The instument of ratification notes a reservation regarding Article 59 of the treaty. The People's Democratic Republic of Algeria will become a Contracting State of the PCT on March 8, 2000. Consequently, nationals and residents of the People's Democratic Republic of Algeria are entitled to file international applications under the PCT on and after March 8, 2000, and from the same date it is possible to file international applications designating and electing the People's Democratic Republic of Algeria (country code: DZ).

Listing of PCT Member Countries

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(1) Central African Republic[2]	Accession	15 September 1971	24 January 1978
(2) Senegal[2]	Ratification	08 March 1972	24 January 1978
(3) Madagascar	Ratification	27 March 1972	24 January 1978
(4) Malawi[5]	Accession	16 May 1972	24 January 1978
(5) Cameroon[2]	Accession	15 March 1973	24 January 1978
(6) Chad[2]	Accession	12 February 1974	24 January 1978
(7) Togo[2]	Ratification	28 January 1975	24 January 1978
(8) Gabon[2]	Accession	06 March 1975	24 January 1978
(9) United States of America	Ratification	26 November 1975	24 January 1978
(10) Germany[3]	Ratification	19 July 1976	24 January 1978
(11) Congo[2]	Accession	08 August 1977	24 January 1978
(12) Switzerland[3]	Ratification	14 September 1977	24 January 1978
(13) United Kingdom[3]	Ratification	24 October 1977	24 January 1978
(14) France[3]	Ratification	25 November 1977	25 February 1978
(15) Russian Federation[6]	Ratification	29 December 1977	29 March 1978
(16) Brazil	Ratification	09 January 1978	09 April 1978
(17) Luxembourg[3]	Ratification	31 January 1978	30 April 1978
(18) Sweden[3]	Ratification	17 February 1978	17 May 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark[3]	Ratification	01 September 1978	01 December 1978
(21) Austria[3]	Ratification	23 January 1979	23 April 1979
(22) Monaco[3]	Ratification	22 March 1979	22 June 1979
(23) Netherlands[3]	Ratification	10 April 1979	10 July 1979
(24) Romania	Ratification	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein[3]	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium[3]	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania[2]	Accession	13 January 1983	13 April 1983
(34) Sudan[5]	Accession	16 January 1984	16 April 1984
(35) Bulgaria	Accession	21 February 1984	21 May 1984
(36) Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37) Mali[2]	Accession	19 July 1984	19 October 1984
(38) Barbados	Accession	12 December 1984	12 March 1985
(39) Italy[3]	Ratification	28 December 1984	28 March 1985
(40) Benin[2]	Accession	26 November 1986	26 February 1987
(41) Burkina Faso[2]	Accession	21 December 1988	21 March 1989
(42) Spain[3]	Accession	16 August 1989	16 November 1989
(43) Canada	Ratification	02 October 1989	02 January 1990
(44) Greece[3]	Accession	09 July 1990	09 October 1990
(45) Poland	Accession	25 September 1990	25 December 1990
(46) Côte d'Ivoire[2]	Ratification	31 January 1991	30 April 1991
(47) Guinea[2]	Accession	27 February 1991	27 May 1991
(48) Mongolia	Accession	27 February 1991	27 May 1991
(49) Czech Republic	Declaration[4]	18 December 1992	01 January 1993
(50) Ireland[3]	Ratification	01 May 1992	01 August 1992
(51) Portugal[3]	Accession	24 August 1992	24 November 1992
(52) New Zealand	Accession	01 September 1992	01 December 1992
(53) Ukraine	Declaration[4]	21 September 1992	25 December 1991
(54) Viet Nam	Accession	10 December 1992	10 March 1993
(55) Slovakia	Declaration[4]	30 December 1992	01 January 1993
(56) Niger[2]	Accession	21 December 1992	21 March 1993
(57) Kazakstan[6]	Declaration[4]	16 February 1993	25 December 1991
(58) Belarus[6]	Declaration[4]	14 April 1993	25 December 1991
(59) Latvia	Accession	07 June 1993	07 September 1993
(60) Uzbekistan	Declaration[4]	18 August 1993	25 December 1991

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(61) China	Accession	01 October 1993	01 January 1994
(62) Slovenia	Accession	01 December 1993	01 March 1994
(63) Trinidad and Tobago	Accession	10 December 1993	10 March 1994
(64) Georgia	Declaration[4]	18 January 1994	25 December 1991
(65) Kyrgyzstan[6]	Declaration[4]	14 February 1994	25 December 1991
(66) Republic of Moldova[6]	Declaration[4]	14 February 1994	25 December 1991
(67) Tajikistan	Declaration[4]	14 February 1994	25 December 1991
(68) Kenya[5]	Accession	08 March 1994	08 June 1994
(69) Lithuania	Accession	05 April 1994	05 July 1994
(70) Armenia[6]	Declaration[4]	17 May 1994	25 December 1991
(71) Estonia	Accession	24 May 1994	24 August 1994
(72) Liberia	Accession	27 May 1994	27 August 1994
(73) Swaziland[5]	Accession	20 June 1994	20 September 1994
(74) Mexico	Accession	01 October 1994	01 January 1995
(75) Uganda[5]	Accession	09 November 1994	09 February 1995
(76) Singapore	Accession	23 November 1994	23 February 1995
(77) Iceland	Accession	23 December 1994	23 March 1995
(78) Turkmenistan[6]	Declaration[4]	01 March 1995	25 December 1991
(79) The former Yugoslav Republic of Macedonia	Accession	10 May 1995	10 August 1995
(80) Albania	Accession	04 July 1995	04 October 1995
(81) Lesotho[5]	Accession	21 July 1995	21 October 1995
(82) Azerbaijan[6]	Accession	25 September 1995	25 December 1995
(83) Turkey	Accession	01 October 1995	01 January 1996
(84) Israel	Ratification	01 March 1996	01 June 1996
(85) Cuba	Accession	16 April 1996	16 July 1996
(86) Saint Lucia	Accession	30 May 1996	30 August 1996
(87) Bosnia and Herzegovina	Accession	7 June 1996	7 September 1996
(88) Federal Republic of Yugoslavia[7]	Ratification	01 November 1996	01 February 1997
(89) Ghana[5]	Accession	26 November 1996	26 February 1997
(90) Zimbabwe[5]	Accession	11 March 1997	11 June 1997
(91) Sierra Leone	Accession	17 March 1997	17 June 1997
(92) Indonesia	Accession	05 June 1997	05 September 1997
(93) Gambia[5]	Accession	09 September 1997	09 December 1997
(94) Guinea-Bissau	Accession	12 September 1997	12 December 1997
(95) Cyprus	Accession	01 January 1998	01 April 1998
(96) Croatia	Accession	01 April 1998	01 July 1998
(97) Grenada	Accession	22 June 1998	22 September 1998
(98) India	Accession	07 September 1998	07 December 1998
(99) United Arab Emirates	Accession	10 December 1998	10 March 1999
(100) Republic of South Africa	Accession	16 December 1998	16 March 1999
(101) Republic of Costa Rica	Accession	03 May 1999	03 August 1999
(102) Commonwealth of Dominica	Accession	07 May 1999	07 August 1999
(103) United Republic of Tanzania	Accession	14 June 1999	14 September 1999
(104) Morocco	Accession	08 July 1999	08 October 1999
(105) Algeria	Ratification	08 December 1999	08 March 2000

[1]Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

[2]Member of African Intellectual Property Organization (OAPI) regional patent system.

[3]Member of European Patent Convention (EPC) regional patent system.

[4]Declaration of continued application.

[5]Member of African Regional Industrial Property Organization (ARIPO) regional patent system.

[6]Member of Eurasian Patent Organization (EAPO) regional patent system.

[7]The Federal Republic of Yugoslavia is comprised of the Republics of Serbia and Montenegro. The World Intellectual Property Organization has utilized the two-letter code "YU" to refer to the Federal Republic of Yugoslavia becoming a party to the Patent Cooperation Treaty. The United States understands that the scope of the territory covered by the designation encompasses only the Republics of Serbia and Montenegro.

December 21, 1999

Q. TODD DICKINSON
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 7, 1997 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,590,420 through 5,592,686
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 5, 1993 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,175,886 through 5,177,809
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 3, 1989 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,794,652 through 4,796,301
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $470.00
By other than a small entity $940.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $950.00
By other than a small entity $1900.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1455.00
By other than a small entity $2910.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $700.00
(2) unintentional $1,640.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED ON November 10, 1999 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Application Number	Issue Date
4,704,745	07/013,724	11/10/87
4,704,747	06/874,062	11/10/87
4,704,761	06/882,484	11/10/87
4,704,762	06/892,177	11/10/87
4,704,770	06/927,127	11/10/87
4,704,772	06/924,972	11/10/87
4,704,774	07/032,750	11/10/87
4,704,779	06/904,504	11/10/87
4,704,781	06/892,701	11/10/87
4,704,785	06/893,437	11/10/87
4,704,789	06/832,888	11/10/87
4,704,791	06/836,376	11/10/87
4,704,794	06/750,157	11/10/87
4,704,797	06/898,190	11/10/87
4,704,804	06/589,260	11/10/87
4,704,813	06/916,372	11/10/87
4,704,819	06/856,932	11/10/87
4,704,828	06/872,229	11/10/87
4,704,836	06/829,658	11/10/87
4,704,847	06/806,531	11/10/87
4,704,848	06/750,788	11/10/87
4,704,853	06/879,112	11/10/87
4,704,855	06/874,297	11/10/87
4,704,858	06/914,279	11/10/87
4,704,863	06/810,766	11/10/87
4,704,871	06/848,001	11/10/87
4,704,872	06/934,585	11/10/87
4,704,874	06/905,241	11/10/87
4,704,877	06/914,278	11/10/87
4,704,885	06/906,575	11/10/87
4,704,888	06/859,839	11/10/87
4,704,897	06/911,256	11/10/87
4,704,899	06/692,061	11/10/87
4,704,913	06/844,464	11/10/87
4,704,914	06/839,968	11/10/87
4,704,917	06/800,456	11/10/87
4,704,919	06/841,273	11/10/87
4,704,920	06/854,353	11/10/87
4,704,921	06/849,783	11/10/87
4,704,922	06/925,359	11/10/87
4,704,927	06/746,622	11/10/87
4,704,931	06/874,589	11/10/87
4,704,932	06/920,147	11/10/87
4,704,935	06/914,823	11/10/87
4,704,944	06/884,665	11/10/87
4,704,954	06/928,968	11/10/87
4,704,972	07/003,340	11/10/87
4,704,973	06/884,953	11/10/87
4,704,974	06/900,022	11/10/87
4,704,975	06/865,550	11/10/87
4,704,977	06/890,348	11/10/87
4,704,983	06/772,871	11/10/87
4,704,996	06/820,868	11/10/87
4,704,997	06/878,079	11/10/87

Patent Number	Application Number	Issue Date
4,704,999	06/870,143	11/10/87
4,705,003	06/788,485	11/10/87
4,705,006	06/367,980	11/10/87
4,705,014	06/687,482	11/10/87
4,705,022	06/911,971	11/10/87
4,705,035	06/902,766	11/10/87
4,705,039	06/759,416	11/10/87
4,705,041	06/910,154	11/10/87
4,705,045	06/832,763	11/10/87
4,705,049	06/892,993	11/10/87
4,705,055	06/802,427	11/10/87
4,705,058	06/869,415	11/10/87
4,705,067	06/862,760	11/10/87
4,705,068	06/923,414	11/10/87
4,705,070	06/940,037	11/10/87
4,705,071	06/806,568	11/10/87
4,705,080	06/899,554	11/10/87
4,705,091	06/758,374	11/10/87
4,705,093	06/875,727	11/10/87
4,705,094	06/888,142	11/10/87
4,705,095	06/817,514	11/10/87
4,705,099	06/726,774	11/10/87
4,705,105	06/860,622	11/10/87
4,705,111	06/896,996	11/10/87
4,705,112	06/892,870	11/10/87
4,705,117	06/801,167	11/10/87
4,705,118	06/803,403	11/10/87
4,705,122	06/818,628	11/10/87
4,705,124	06/899,529	11/10/87
4,705,134	06/855,056	11/10/87
4,705,139	06/904,902	11/10/87
4,705,140	07/028,124	11/10/87
4,705,146	06/596,176	11/10/87
4,705,148	06/683,915	11/10/87
4,705,150	06/749,965	11/10/87
4,705,152	06/866,222	11/10/87
4,705,155	06/686,680	11/10/87
4,705,156	06/798,573	11/10/87
4,705,162	06/929,800	11/10/87
4,705,165	06/781,740	11/10/87
4,705,168	06/400,386	11/10/87
4,705,170	06/895,507	11/10/87
4,705,176	06/880,730	11/10/87
4,705,190	07/006,369	11/10/87
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Patent Number	Application Number	Issue Date
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DUE TO FAILURE TO PAY MAINTENANCE FEES

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Patent Number	Application Number	Issue Date
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Patent Number	Application Number	Issue Date
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4,940,239	07/272,111	11/16/88	07/10/90	12/09/99
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Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

D. 409,632, Re. S.N. 29/113,479, Sep. 24, 1999, Cl. D15/139, CUTTING TOOL INSERTS, Rudi Hartlohner, et. al., Owner of Record: *Kennametal Inc., Latrobe, PA,* Attorney or Agent: John J. Prizzi, Ex. Gp.: 2900

5,117,539, Re. S.N. 09/444,416, Nov. 19, 1999, Cl. 024/599.800, CLASP MECHANISM, James P. Shrader, et. al., Owner of Record: *Oroamerica Inc., Burbank, CA,* Attorney or Agent: I. Morley Drucker, Ex. Gp.: 3626

5,173,814, Re. S.N. 09/441,504, Nov. 17, 1999, Cl. 360/098.070, DISK STORAGE DEVICE HAVING AN UNDERCUT HUB MEMBER, Dieter Elsasser, et. al., Owner of Record: *Papst Licensing GmbH & Co., Spaichingen, Germany,* Attorney or Agent: Jerold B. Schnayer, Ex. Gp.: 2753

5,409,861, Re. S.N. 09/293,207, Apr. 16, 1999, Cl. 437/195.000, METHOD FOR FORMING A VIA PLUG IN A SEMICONDUCTOR DEVICE, Kyeon K. Choi, Owner of Record: *Hyundai Electronics Industries Co. Ltd., Kyungki-do, Korea,* Attorney or Agent: Ramin Aghevli, Ex. Gp.: 2812

5,576,070, Re. S.N. 09/441,139, Nov. 16, 1999, Cl. 427/510, METHOD OF FABRICATING A LIQUID CRYSTAL DISPLAY, Zvi Yaniv, Owner of Record: *LG Electronics Inc., Seoul, Korea,* Attorney or Agent: Song K. Jung, Ex. Gp.: 1762

5,591,235, Re. S.N. 09/227,163, Jan. 7, 1999, Cl. 623/017.000, SPINAL FIXATION DEVICE, Stephen D. Kuslich, Owner of Record: *Spineology, Inc., Stillwater, MN,* Attorney or Agent: Scott Q. Vidas, Ex. Gp.: 3732

5,619,543, Re. S.N. 09/436,691, Nov. 5, 1999, Cl. 375/376, DIGITAL PHASE-LOCKED LOOP FILTER, William Glass, Owner of Record: *SGS-Thomson Microelectronics S.A., Gentilly, France,* Attorney or Agent: James H. Morris, Ex. Gp.: 2734

5,621,860, Re. S.N. 09/435,135, Nov. 5, 1999, Cl. 395/003, MEMORY ORGANIZATION METHOD FOR A FUZZY LOGIC CONTROLLER AND CORRESPONDING DEVICE, Biagio Russo, et. al., Owner of Record: *SGS-Thomson Microelectronics S.R.L., Agrate Brianza, Italy,* Attorney or Agent: James H. Morris, Ex. Gp.: 2786

5,658,475, Re. S.N. 09/374,758, Aug. 13, 1999, Cl. 219/121, APPARATUS FOR LASER TEXTURING DISKS, Michael Berenboim, et. al., Owner of Record: *International Business Machines Corp., Armonk, NY,* Attorney or Agent: Ronald V. Davidge, Ex. Gp.: 1742

5,686,727, Re. S.N. 09/437,625, Nov. 10, 1999, Cl. 250/372, ULTRAVIOLET EXPOSURE DETECTION APPARATUS, Arthur Reenstra, et. al., Owner of Record: *Seeuv, LLC., Winchester, MA,* Attorney or Agent: Curtis A. Vock, Ex. Gp.: 2878

5,690,676, Re. S.N. 09/447,228, Nov. 22, 1999, Cl. 606/232, SUTURE ANCHOR AND DRIVE ASSEMBLY, Gene Philip Dipoto, et. al., Owner of Record: *Smith & Nephew Inc.,*

Andover, MA, Attorney or Agent: Joel R. Petrow, Ex. Gp.: 3731

5,691,101, Re. S.N. 09/448,977, Nov. 24, 1999, Cl. 430/176, PHOTOSENSITIVE COMPOSITION, Toru Ishirogouchi, Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-shi, Japan*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 1752

5,692,457, Re. S.N. 09/453,602, Nov. 30, 1999, Cl. 122/510, ENERGY ABSORBING TUBE SUPPORT FOR FURNACE, Roger Alan Detzel, et. al., Owner of Record: *The Babcock & Wilcox Co., New Orleans, LA*, Attorney or Agent: Glenn E. Forbis, Ex. Gp.: 3742

5,866,743, Re. S.N. 09/455,515, Dec. 6, 1999, Cl. 585/486, HYDRODEALKYLATION PROCESSES, John V. Heyse, et. al., Owner of Record: *Chevron Chemical Co. LLC., San Francisco, CA*, Attorney or Agent: Lawrence S. Squires, Ex. Gp.: 1764

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,060,401, Reexam. S.N. 09/005,556, Nov. 10, 1999, Cl. 036/025R, FOOTWEAR CUSHIONING SPRING, Ian H Whatley, Owner of Record: *Inventor*, Attorney or Agent: Lyon and Lyon, Los Angeles, Calif., Ex. Gp.: 3728, Requester: Owner

5,091,859, Reexam. S.N. 09/005,559, Nov. 12, 1999, Cl. 700/117, CONTROL SYSTEM FOR A PRINTING PLANT, Oded Zingher, et. al., Owner of Record: *Man Roland Druckmachinen A G., Offenbach/Main, Germany*, Attorney or Agent: Joseph R Keating, Graham and James, Los Angeles, Calif., Ex. Gp.: 2786, Requester: Owner

5,242,343, Reexam. S.N. 09/005,560, Nov. 12, 1999, Cl. 482/057, STATIONARY EXERCISE DEVICE, Larry Miller, Owner of Record: *Icon Health and Fitness, Logan, Utah*, Attorney or Agent: Ronald W Citkowski, Gifford Krass Groh Sprinkle Anderson and Citkowski, Birmingham, Mich., Ex. Gp.: 3733, Requester: Michael B McMurry, Chicago, Ill.

5,271,338, Reexam. S.N. 09/005,554, Nov. 9, 1999, Cl. 108/161, TABLETOP APPARATUS AND METHOD OF CONSTRUCTION, Brent Bonham, Owner of Record: *Mity-Lite, Inc., Orem, Utah*, Attorney or Agent: Vaughn W North, Thorpe North and Western, Sandy, Utah, Ex. Gp.: 3624, Requester: Owner

5,279,051, Reexam. S.N. 09/005,557, Nov. 10, 1999, Cl. 036/025R, FOOTWEAR CUSHIONING SPRING, Ian H Whatley, Owner of Record: *Inventor*, Attorney or Agent: Lyon and Lyon, Los Angeles, Calif., Ex. Gp.: 3728, Requester: Owner

5,383,829, Reexam. S.N. 09/005,561, Nov. 12, 1999, Cl. 482/057, STATIONARY EXERCISE DEVICE, Larry Miller, Owner of Record: *Icon Health and Fitness, Logan, Utah*, Attorney or Agent: Ronald W. Citkowski, Gifford Krass Groh Sprinkle Anderson and Citkowski, Birmingham, Mich., Ex. Gp.: 3733, Requester: Michael B. McMurry, Chicago, Ill.

5,668,087, Reexam. S.N. 09/005,558, Nov. 10, 1999, Cl. 504/247, HERBICIDAL 1-ALKENYLTETRAZOLINONES, Toshio Goto, et. al., Owner of Record: *Nihon Bayer Agrochem K. K., Tokyo, Japan*, Attorney or Agent: Carmella A O'Gorman, Norris McLaughlin and Marcus, Tarrytown, N.Y., Ex. Gp.: 1616, Requester: Owner

5,812,228, Reexam. S.N. 09/005,555, Nov. 9, 1999, Cl. 349/106, COLOR LIQUID CRYSTAL DISPLAY WITH EXTENSIONS OF THE COLORED LAYER COVER THE LIGHT-IMPERMEABLE LAYER, Junichirou Miura, et. al., Owner of Record: *Nec Corporation, Tokyo, Japan*, Attorney or Agent: George C. Best, Foley and Lardner, Washington, D.C., Ex. Gp.: 2781, Requester: Owner

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Notice Regarding Technical Center Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998 NICHOLAS P. GODICI
Deputy Assistant Commissioner for Patents (Acting)

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR §10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR §10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before February 25, 2000.

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Financial Services Available Over the Internet

The Revenue Accounting and Management (RAM) system, which is a Patent and Trademark Office (PTO) automated financial system, was upgraded in December 1999 to provide customers with added convenience and enhanced financial services. The upgrade is part of the PTO's long-term strategy to modernize financial management practices and procedures, to provide increased options for paying required fees, and to provide improved customer service to PTO's customers.

As a major benefit, the upgraded RAM system, using a secure environment, allows the following transactions to occur over the Internet through the PTO Web site at www.uspto.gov:

- replenish deposit account balances using a credit card;
- view deposit account information including holder name, address, and current balance;
- request a deposit account statement;
- add, change, or delete deposit account authorized users;
- request a form to change entity status;
- pay maintenance fees using a credit card; and
- view 3 1/2, 7 1/2 and 11 1/2 year payment window dates for maintenance fees.

We currently accept any of the following credit cards: American Express, Discover Card, MasterCard, or Visa. These enhancements are designed solely to provide customers with alternative methods of payment.

Customers using either the Netscape Navigator (Version 2.0 or higher) or Microsoft Internet Explorer (Version 3.0 or higher) browser can access the enhanced financial services features. The browser must be properly configured to use Secure Sockets Layer (SSL) technology that encrypts data traveling between your browser and our server to protect your privacy.

Passwords and access codes to replenish deposit account balances using a credit card; to view deposit account information including holder name, address, and current balance; and, to request a deposit account statement will be provided to current deposit account holders along with their monthly deposit account statements.

Questions regarding deposit accounts should be directed to Karen Parish at (703) 305-4636. Questions regarding patent maintenance fees should be directed to the Maintenance Fee Branch at (703) 308-5068 or (703) 308-5069.

Questions or comments concerning this notice should be forwarded to Matthew Lee by telephone at (703) 305-8051, by e-mail at matthew.lee@uspto.gov, by facsimile at (703) 305-8007, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Office of Finance, Crystal Park 1, Suite 802, Washington, D.C. 20231.

Dec. 28, 1999

Q. TODD DICKINSON
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Certificates of Correction for January 18, 2000

4,746,872	5,856,103	5,900,924	5,917,973
5,296,503	5,856,387	5,902,669	5,919,523
5,447,225	5,859,045	5,903,253	5,919,576
5,516,931	5,861,194	5,903,319	5,919,634
5,S78,443	5,861,892	5,903,363	5,919,716
5,593,879	5,864,499	5,903,490	5,919,805
5,608,052	5,865,381	5,903,519	5,919,847
5,665,462	5,866,043	5,903,647	5,920,003
5,688,662	5,866,690	5,903,747	5,921,668
5,699,235	5,869,653	5,903,802	5,921,684
5,706,421	5,869,844	5,905,460	5,921,852
5,713,037	5,870,679	5,905,483	5,922,073
5,741,570	5,871,109	5,905,695	5,925,639
5,742,530	5,871,855	5,906,237	5,926,554
5,750,551	5,872,869	5,906,284	5,927,897
5,759,875	5,875,280	5,906,322	5,928,528
5,765,444	5,877,369	5,906,438	5,928,570
5,767,208	5,877,797	5,906,589	5,928,806
5,775,866	5,878,472	5,906,639	5,929,144
5,775,883	5,880,337	5,907,824	5,929,156
5,790,430	5,880,487	5,907,857	5,931,993
5,794,725	5,882,642	5,908,487	5,932,158
5,797,i32	5,883,118	5,908,820	5,932,364
5,798,771	5,883,515	5,909,582	5,932,472
5,807,712	5,884,170	5,909,697	5,939,454
5,817,402	5,884,685	5,909,838	5,939,612
5,819,013	5,884,894	5,910,811	5,939,760
5,829,045	5,885,997	5,911,147	5,939,938
5,830,736	5,888,203	5,911,290	5,940,652
5,832,872	5,890,416	5,911,873	5,941,052
5,833,618	5,892,634	5,912,131	5,941,110
5,835,116	5,893,041	5,914,313	5,941,849
5,835,155	5,893,924	5,914,538	5,942,239
5,837,227	5,895,144	5,914,543	5,942,736
5,840,926	5,895,268	5,915,131	5,943,802
5,843,544	5,896,879	5,915,523	5,945,566
5,843,641	5,897,119	5,915,574	5,950,484
5,851,666	5,897,306	5,916,487	
5,854,403	5,897,896	5,916,953	
5,856,056	5,898,637	5,917,234	

Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

December 6-10, 1999

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
12-7	EX	75/153,859	AAMP of Florida, Inc.	2(d)	Refusal Affirmed		"BEST" [electrical wiring harnesses for use in automobiles, comprising electrical wiring, electrical jacks, and support brackets]	"BEST" (and design) [airplane engines and component parts for engines, etc.; radios, receivers, instrument panels, air speed indicators, radio head sets, electrical wiring, coaxial cables, computer cables, electrical cables, fiberoptic cables, electrical connectors, electrical transformers, etc.; lightbulbs, florescent starters, faucets, toilets, sinks, etc.; airplane structural parts, etc.]	No
12-7	OPP	106,979	Americar Rental System, Inc. v. David A. Vickman	2(d)	Opposition Sustained	"AMERICAR" [leasing and renting of vehicles; valet airport parking services and automobile cleaning services; automobile rental and leasing services; automobile dealership services]	"AMERICAB" [taxi transport services; and transportation of passengers and freight by automobile, limousine, bus and truck]		No
12-9	EX	75/138,331	Festival Markets,Inc.	2(e)(1); registrability under Section 2(f)	Refusal Affirmed		"INDOOR SWAPMART" [flea market services, namely, the operation of flea markets]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
12-9	EX	75/150,300	Manufactura de Tabacos (MATASA) S. A.	2(d)	Refusal Affirmed		"LA CIMERA" [cigars]	"CREST" (and design) [tobacco and tobacco products, namely, cigars]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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Washington, D.C. 20231

Box Designations	Explanation
Box REISSUE	All new and continuing Reissue application filings.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

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Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of on-line systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI^3) in Sunnyvale, California.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(334) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(480) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6220
Connecticut	Hartford Public Library	(860) 543-8628
	New Haven Free Public Library	(203) 946-8130
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(954) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(765) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 284-6541
Kansas	Wichita: Ablah Library, Wichita State University	(316) 978-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(225) 388-8875
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(734) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(231) 591-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 630-6120
Mississippi	Jackson: Mississippi Library Commission	(601) 961-4111
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Las Vegas—Clark County Library District	Not Yet Operational
	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

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New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(973) 733-7779
	Piscataway: Library of Science and Medicine, Rutgers University	(732) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101
	Rochester Public Library	Not Yet Operational
	New York Public Library (The Research Libraries)	(212) 592-7000
	Stony Brook: Engineering Library, State University of New York	(516) 632-7148
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-2935
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(330) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6971
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-3022
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 2022
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(864) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-1275
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2717
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-5745
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	(806) 742-2282
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	(802) 656-2542
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4695 Ext. 5113
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT TECHNOLOGY CENTERS

Q. TODD DICKINSON, Assistant Secretary of Commerce and
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NICHOLAS P. GODICI, Deputy Assistant Commissioner for Patent Process Services
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STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy and Projects

TECHNOLOGY CENTERS		DIRECTORS	TELEPHONE & FAX NUMBERS AREA CODE 703	NEW CASE DATE*
1600/2900	**BIOTECHNOLOGY, ORGANIC CHEMISTRY & DESIGN**			
1610	Organic chemistry, bio-affecting & body treating composition	John E. Kittle	308-0193 FAX 308-7922	06/22/98
1620	Carbohydrates and Nonhetrocyclic Chemistry and Uses			02/17/99
1650	Non-recombinant molecular & microbiology, non-immuno proteins & peptides			07/08/98
2900	Designs			11/09/98
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1640	Immunology and Plants			04/17/98
1700	**CHEMICAL AND MATERIAL ENGINEERING**			
1710	Synthetic resins	Jacqueline M. Stone (Acting Director)	308-1495 FAX 305-3599	10/30/98
1770	Stock materials & miscellaneous articles			02/20/98
1720	Fluid separation & agitation, metal foundry, welding, plastic molding apparatus, fuels & related compositions	Richard V. Fisher	308-1193 FAX 305-3599	08/05/98
1730	Glass & paper making, tobacco, non-metallic molding, adhesive bonding, tires & coating apparatus			09/30/98
1740	Metallurgy, electrochemistry, cleaning, disinfecting, sterilizing, analytical chemistry & wave energy			07/09/98
1750	Chemical products & processes, solar cells & sputtering apparatuses	Esther M. Kepplinger	308-1495 FAX 305-3599	07/29/98
1760	Food technology, petroleum processing, coating & etching			06/22/98
2700	**COMMUNICATIONS AND INFORMATION PROCESSING**			
2710	Television	James L. Dwyer (Acting Director)	305-4800 FAX 308-5401	03/28/98
2740	Audio, radio, telephone & speech processing			09/24/97
2720	Image & fax	Jin F. Ng	305-4800 FAX 308-5401	11/20/97
2730	General communications & digital communication systems			08/27/97
2750	Storage processing, multiple computers, & multiple process coordinating	Robert E. Garrett	305-0286 FAX 305-3719	03/19/98
2760	Electronic commerce & specialized data processing	Joseph J. Rolla	305-9700 FAX 308-5355	12/16/97
2780	Processors, control systems, input/output			12/11/97
2770	Computer graphics & data bases	Gerald Goldberg	305-9700 FAX 308-5355	10/24/97

TECHNOLOGY CENTERS		DIRECTORS	TELEPHONE & FAX NUMBERS AREA CODE 703	NEW CASE DATE*
2800	**SEMICONDUCTORS, ELECTRICAL AND OPTICAL SYSTEMS AND COMPONENTS**			
2810	Semiconductors, electrical circuits, static memory, digital logic	Rolf G. Hille	306-3431 FAX 308-7725	04/06/98
2820	Semiconductors & electrical circuits			03/12/98
2830	Power generation & distribution, music, electrical components & control circuits	Stewart J. Levy	308-0658 FAX 308-7722	02/27/98
2850	Photocopying, recorders, printing, measuring & testing	Margaret A. Focarino	306-3431 FAX 308-7725	05/08/98
2860	Printing			04/09/98
2870	Liquid crystals, optical elements, optical systems, fiber optics, lasers, electric lamps, registers, optics measuring & radiant energy	Janice A. Howell	308-0530 FAX 305-3594	08/01/97
3600	**TRANSPORTATION, CONSTRUCTION, AGRICULTURE & NATIONAL SECURITY**			
3610	Surface transportation	Richard A. Bertsch	308-1134 FAX 308-2177	05/29/98
3650	Material handling			08/05/98
3620	Closures, connections, hardware and furniture	Al Lawrence Smith	308-1020 FAX 306-4597	11/24/98
3630	Static structures, supports and sign exhibiting			10/15/98
3680	Machine elements and power transmissions			03/03/99
3640	Aeronautics, agriculture, plant and animal husbandry, weaponry, nuclear systems and Licensing and Review	John F. Terapane, Jr.	306-4174 FAX 306-4598	04/16/98
3660	Computerized vehicle controls and navigation, radio wave and acoustic wave communication			04/17/98
3670	Wells, earth boring/moving/working, excavating, mining, harvesters, bridges and roads			07/29/98
3700	**MECHANICAL ENGINEERING, MANUFACTURING AND PRODUCTS**			
3710	Amusement and education devices	Ethel Rollins-Cross	308-1078 FAX 305-3579	09/23/98
3720	Packages, containers, manufacturing devices & processes, machine tools & hand tools			10/27/98
3730	Medical instruments, diagnostic equipment, treatment devices, surgery & surgical supplies	John J. Love	308-0873 FAX 308-3139	10/20/97
3760	Body treatment, kinestherapy, & exercising			04/09/98
3740	Thermal & combustion technology, motive and fluid power systems, textile manufacturing & apparel	Donald G. Kelly	308-0975 FAX 308-7763	01/22/98
3750	Fluid handling & dispensing			11/11/98

* A communication from the examiner should have been received in most applications filed prior to this date.

TRADEMARK OPERATION

Q. Todd Dickinson, Commissioner of Patents and Trademarks
Anne Chasser, Assistant Commissioner for Trademarks
Condition of Trademark Applications as of November 1, 1999

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Jerry Price, Managing Attorney, (703) 308–9101—North Tower, 10th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/07/99	04/21/99
Law Office 102—Thomas Shaw, Managing Attorney, (703) 308–9102—South Tower, 5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/31/99	04/29/99
Law Office 103—Michael A. Szoke, Managing Attorney, (703) 308–9103—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/29/99	07/21/99
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—South Tower, 6th Floor, Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/07/99	05/03/99
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—South Tower, 6th Floor, Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/23/99	07/06/99
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—South Tower, 7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/03/99	06/14/99
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—South Tower, 7th Floor, Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/12/99	06/02/99
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—South Tower, 8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/20/99	04/01/99
Law Office 109—Ronald Sussman, Managing Attorney, (703) 308–9109—South Tower, 8th Floor, Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/15/99	06/19/99
Law Office 110—Christopher A. F. Pedersen, Managing Attorney, (703) 308–9110—South Tower, 7th Floor, Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/20/99	08/10/99
Law Office 111—Craig Taylor, Managing Attorney, (703) 308–9111—North Tower, 10th Floor, Foods, Beverages, Wines & Spirits—Int. Classes 20, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/26/99	06/01/99
Law Office 112—Janice O'Lear, Managing Attorney, (703) 308–9112—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/27/99	04/12/99
Law Office 113—Meryl Hershkowitz, Managing Attorney, (703) 308–9113—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/18/99	06/04/99
Law Office 114—Mary Frances Bruce, Managing Attorney, (703) 308–9114—South Tower, 6th Floor, Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/21/99	06/02/99
Law Office 115—Tomas Vlcek, Managing Attorney, (703) 308–9115—North Tower, 3rd Floor, Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/23/99	04/05/99

**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terron Sims, Director, (703) 308-9100		
Trademark Assistance Center—(703) 308-9000		
Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188		
Intent-To-Use—(ITU)—(703) 308-9500		
Post Registration Section—(703) 308-9500		
Affidavits Under Sections 8 & 15 (All Classes)	07/13/99	—0—
Renewals (All Classes)	09/13/99	—0—
Section 12(c) Publications (All Classes)	05/26/99	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

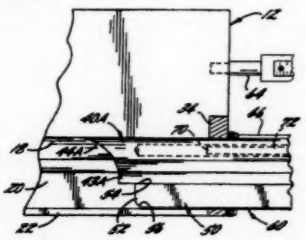
3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

JANUARY 18, 2000

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 5,505,609 (3977th)
INTERNAL DECKLE SYSTEM
Peter F. Cloeren, Orange, and Rolf P. Schulz, Bridge City, both of Tex., assignors to The Cloeren Company, Orange, Tex.
Reexamination Request No. 90/005,219, Jan. 13, 1999.
Reexamination Certificate for Patent 5,505,609, issued Apr. 9, 1996, Appl. No. 331,912, Oct. 31, 1994.
Continuation of application No. 08/175,940, Dec. 30, 1993, which is a continuation of application No. 07/915,485, Jul. 17, 1992, abandoned.
Int. Cl.[7] **B29C** *47/16*
U.S. Cl. 425—381



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

New claims **5–11** are added and determined to be patentable.

1. An extrusion apparatus having an internal deckle system, said extrusion apparatus comprising a body portion comprising a flow passageway comprising a transverse flow-providing manifold, and a channel portion extending to an exit orifice, said channel portion being in fluid communication with said manifold; said internal deckle system comprising

a) a first deckle member

1) adjustably disposed to change the width of said flow passageway, and

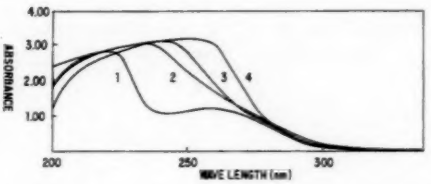
2) comprising a full width, manifold plug portion disposed within said manifold, and, downstream of said manifold, a fin-shaped plug portion, said manifold plug portion and said fin-shaped plug portion each extending through an end of said body portion into said flow passageway, and

b) a second deckle member adjustably disposed within said flow passageway and downstream of said first deckle member.

B1 5,525,634 (3978th)
COLONIC DRUG DELIVERY SYSTEM
Amnon Sintov, and Abraham Rubinstein, both of Jerusalem, Israel, assignors to Perio Products, Ltd., by said Amnon Sintov, and Yissum Research Development Company of the Hebrew University of Jerusalem, by said Abraham Rubinstein
Reexamination Request No. 90/004,990, May 22, 1998.
Reexamination Certificate for Patent 5,525,634, issued Jun. 11, 1996, Appl. No. 193,775, Feb. 10, 1994.
Continuation of application No. 07/694,293, May 2, 1991, abandoned, which is a continuation-in-part of application No. 07/518,714, May 4, 1990, abandoned.
Int. Cl.[7] **A61K** *9/48;9/64;9/36;9/50*
U.S. Cl. 514—777

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

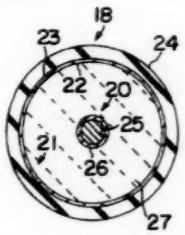
Claim **1** is determined to be patentable as amended.



Claims **2–26**, dependent on an amended claim, are determined to be patentable.

1. A colonic delivery system for administration of a drug to a patient in need of such drug, wherein said colonic delivery system is in oral dosage form and comprises a therapeutically effective amount of said drug in combination with a matrix, said matrix comprising a *natural or synthetic* saccharide-containing polymer, wherein said *natural* saccharide-containing polymer is resistant to chemical and enzymatic degradation in the stomach and small intestine of said patient and is enzymatically degraded in the colon by bacteria located therein such that said matrix is preferentially degraded in the colon and said drug released therein, *and wherein said natural saccharide-containing polymer is a modified or unmodified natural polymer, that, in its unmodified form, is a natural saccharide-containing polymer that is also preferentially enzymatically degraded in the colon of said patient by bacteria located therein.*

B1 5,574,260 (3979th)
COMPOSITE CONDUCTOR HAVING IMPROVED HIGH FREQUENCY SIGNAL TRANSMISSION CHARACTERISTICS
James R. Broomall; Christine M. Foster, both of Newark, Del.; Craig R. Theorin, and Peter A. Widdoes, both of Landenberg, Pa., assignors to W. L. Gore & Associates, Inc., Newark, Del.
Reexamination Request No. 90/004,864, Dec. 9, 1997.
Reexamination Certificate for Patent 5,574,260, issued Nov. 12, 1996, Appl. No. 400,054, Mar. 6, 1995.
Int. Cl.[7] **H01B** *9/04*
U.S. Cl. 174—102 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **14** and **15** is confirmed.

Claims **1**, **5** and **10** are determined to be patentable as amended.

Claims **2–4**, **6–9** and **11–13**, dependent on an amended claim, are determined to be patentable.

1. A composite conductor having improved high frequency signal transmission characteristics comprising:

a conductive base having a permeability μ_2 and a conductivity σ_2; and

a conductive coating disposed upon the conductive base, the conductive coating having a permeability μ_1 and a conductivity σ_1, such that

$$\frac{\mu_2}{\sigma_2} \gg \frac{\mu_1}{\sigma_1}$$

wherein the conductive coating has a thickness ranging from about one-half to about five times a skin depth of said coating; **[**and**]**

wherein a current distribution of the composite conductor is redistributed from the conductive base to the conductive coating by employing a conductive base having a higher surface resistance than the conductive coating;

wherein a signal propagated through said composite conductor, lengthwise of said composite conductor, has a frequency and an amount of attenuation; and

wherein said amount of attenuation is substantially independent of said frequency of said signal.

REISSUES

JANUARY 18, 2000

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 36,496

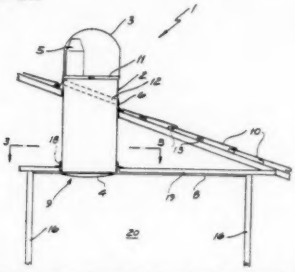
SKYLIGHT

Steven Michael Sutton, Oakhurst, Australia, assignor to Solatube International, Inc., Carlsbad, Calif.

Original No. 5,099,622, dated Mar. 31, 1992, Appl. No. 07/275,398, Nov. 22, 1988. Application for reissue Mar. 29, 1994, Appl. No. 220,001.

Int. Cl.[7] **E04B** *7/18*

U.S. Cl. 52—200 **35 Claims**



1. A skylight system for a building having a roof and a ceiling spaced from said roof with a cavity therebetween, the skylight system comprising:

a tubular body *having a longitudinal axis* for positioning in said cavity, *said tubular body* having a first end and a second end;

a [first] transparent cover, attached to said first end of said body[, extending] *and to extend* above the roof [and] *for* forming a light-permeable chamber above the first end;

a [second transparent] *light-transmitting* cover, attached to said second end of said body, [located] *for location* at said ceiling; and

a reflector, located *substantially laterally of said axis* within said light-permeable chamber [and extending] *to extend* above the roof, to reflect at least some light incident thereon into said body *that would not otherwise enter said body while permitting light to pass downwardly through the transparent cover into said body.*

Re. 36,497

COMBINED CYCLE WITH STEAM COOLED GAS TURBINE

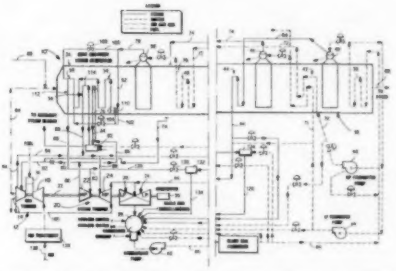
Leroy O. Tomlinson, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Original No. 5,577,377, dated Nov. 26, 1996, Appl. No. 08/442,583, May 16, 1995. Continuation-in-part of application No. 08/417,426, Apr. 5, 1995, Pat. No. 5,628,179, which is a continuation-in-part of application No. 08/161,070, Dec. 3, 1993, Pat. No. 5,428,950, which is a continuation-in-part of application No. 08/145,633, Nov. 4, 1993, Pat. No. 5,412,937. Application for reissue Nov. 24, 1998, Appl. No. 198,505.

Int. Cl.[7] **F02C** *6/18*

U.S. Cl. 60—39.02 **15 Claims**

13. In a method of operating a combined cycle system including a gas turbine combined with a steam cycle incorporating a steam turbine and a multi-pressure heat recovery steam generator, wherein gas turbine exhaust is used in the heat recovery steam generator for reheating steam from the steam turbine, the improvement comprising supplying gas turbine cooling duty steam from a high pressure section of the steam turbine and from an intermediate pressure evaporator in the multi-pressure heat recovery steam generator, conducting the gas turbine cooling duty steam to the gas turbine for cooling hot gas turbine parts, and then returning the gas turbine cooling duty steam to the steam cycle; and wherein, early in start-up, prior to the availability of any cooling steam, the



gas turbine hot stationary and rotating parts are cooled with filtered compressor discharge air, which, after cooling the gas turbine hot stationary and rotating parts, is discharged to the gas turbine exhaust.

Re. 36,498

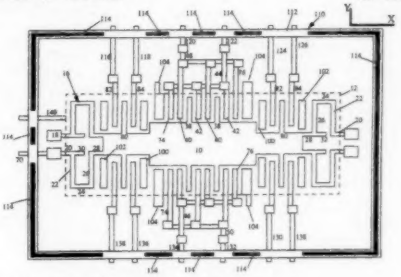
SENSOR WITH SEPARATE ACTUATOR AND SENSE FINGERS

Roger T. Howe, Martinez, Calif., and Stephen Bart, Newton, Mass., assignors to Analog Devices, Norwood, Mass.

Original No. 5,565,625, dated Oct. 15, 1996, Appl. No. 08/347,795, Dec. 1, 1994. Application for reissue Oct. 14, 1998, Appl. No. 172,541.

Int. Cl.[7] **G01P** *15/08*

U.S. Cl. 73—514.16 **39 Claims**



33. A micromachined device comprising:

a plurality of anchors connected to a substrate;

a member suspended above the substrate having at least one member finger extending from the member, the member finger having a left side and a right side;

a plurality of suspension arms suspended above the substrate, with each of the plurality of suspension arms having a first end connected to the member and a second end connected to one of the plurality of anchors so that the member is movable along an axis parallel to the substrate;

at least one left finger parallel to the at least one member finger, with one of the at least one left fingers being adjacent to the left side of each member finger, and the at least one left finger forming a first capacitor with the at least one member finger;

at least one right finger parallel to the at least one member finger, with one of the at least one right fingers being adjacent to the right side of each member finger, and the at least one right finger forming a second capacitor with the at least one member finger; and

a conductive guard ring formed above and mechanically connected to the substrate, wherein the guard ring surrounds the member, the plurality of suspension arms, the at least one left finger, and the at least one right finger.

Re. 36,499

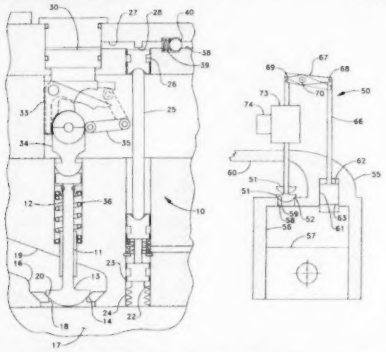
METHOD AND APPARATUS FOR HOLDING A CYLINDER VALVE CLOSED DURING COMBUSTION

Dennis D. Feucht, Morton, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Original No. 5,615,646, dated Apr. 1, 1997, Appl. No. 08/635,799, Apr. 22, 1996. Application for reissue Jun. 18, 1998, Appl. No. 99,892.

Int. Cl.[7] **F01L** *9/02;1/30*

U.S. Cl. 123—90.12 **19 Claims**



1. A method of holding a cylinder valve for an engine closed during combustion, comprising the steps of:

providing an engine with a hollow piston cylinder in fluid communication with a gas passageway via an opening, and having a piston bore that opens to said hollow piston cylinder;

including an outward valve seat in said opening adjacent said gas passageway;

providing an outward valve member with a valve face, and said valve member being movable between a closed position in which said valve face is against said valve seat closing said opening and an open position in which valve face is away from said valve seat;

positioning an intensifier piston in said piston bore so that one end contacts gas within said hollow piston cylinder; and

coupling said intensifier piston to said outward valve member, *at least in part with an over center device,* such that a force on said intensifier piston from combustion pressure within said hollow piston cylinder is transformed into a force on said outward valve member that is opposite in direction and greater in magnitude to a force on said outward valve member from said combustion pressure within said hollow piston cylinder.

Re. 36,500

INTERNAL COMBUSTION ENGINE

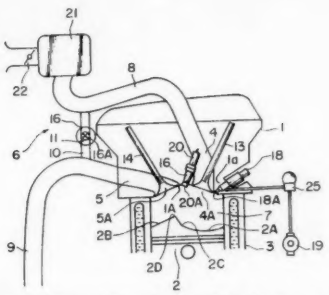
Hiromitsu Ando, Okazaki; Jun Takemura, Toyota; Kazuyoshi Nakane, Okazaki, and Tetsuji Saeki, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 5,305,720, dated Apr. 26, 1994, Appl. No. 08/022,630, Feb. 25, 1993. Application for reissue Apr. 25, 1996, Appl. No. 637,528.

Claims priority, application Japan, Feb. 28, 1992, 4-044006; Feb. 28, 1992, 4-044008; Feb. 28, 1992, 4-044009; Nov. 4, 1992, 4-295320; Nov. 4, 1992, 4-295321

Int. Cl.[7] **F02B** *23/00*

U.S. Cl. 123—193.4 **25 Claims**



1. In an internal combustion engine having:

a combustion chamber formed between a top wall of a piston fitted in a cylinder and a lower wall of a cylinder head,

an intake port formed through the cylinder head on one side of a reference plane in which a central axis of the cylinder is contained, said intake port communicating through an intake opening with the combustion chamber,

an exhaust port formed through the cylinder head on an opposite side of said reference plane, said exhaust port communicating through an exhaust opening with the combustion chamber, and

open/close valves disposed in the intake port and the exhaust port, respectively, the improvement comprising:

the intake port is formed extending upstream from the intake opening substantially along the cylinder axis; and

the piston is provided at the top wall thereof with a recessed portion and a raised portion, said recessed portion being formed at a location off-set toward said one side to guide an intake air flow, which has been inducted into the combustion chamber, as a swirl about an axis extending in parallel with a line which in turn extends at a right angle relative to the cylinder axis, and said raised portion being formed on the opposite side of said reference plane to extend in continuation with an **[**upwardly gently sloping**]** edge portion of the recessed portion, whereby the raised portion approaches the lower wall of the cylinder head at top dead center of the piston.

Re. 36,501

METHOD FOR PRODUCING INFLATED DUNNAGE

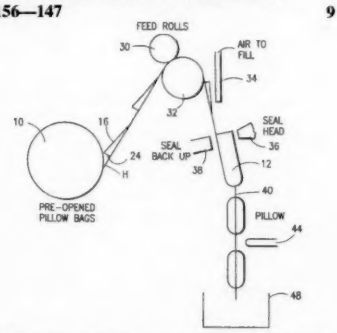
Gregory A. Hoover, 700 Scotland St., Dunedin, Fla. 34698; Roger A. Hoover, 2661 Crystal Cir., Dunedin, Fla. 34698; E. Riley Rowe, 519 White Oak Cir., Hartsville, S.C. 29550, and David L. Rowe, 11904 E. Appaloosa Run, Raleigh, N.C. 27613

Original No. 5,552,003, dated Sep. 3, 1996, Appl. No. 08/317,760, Oct. 4, 1994. Application for reissue Sep. 2, 1998, Appl. No. 145,666.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B65B** *61/00;* **B63B** *25/24*

U.S. Cl. 156—147 **9 Claims**



6. A method for producing dunnage comprising the steps of;

a) forming a multi-layered elongated web of interconnected bags from plastic film having outer surfaces of greater tack than inner surfaces, the layers being interconnected such that each of the bas has a fill openings communicating with an otherwise perimetrically closed fill space;

b) transporting the web of interconnected bags to a site where dunnage is to be produced;

c) sequentially blowing air through the bag fill openings to fill the communicating fill spaces;

d) sealing each filled bag to close the fill opening of each such filled bag;

e) separating a selected number of filled bags from the web; and,

f) placing such separated bags as dunnage in interlocking relationships in a package being formed.

Re. 36,502

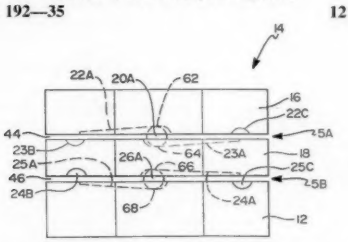
CLUTCH BALL RAMP ACTUATOR WITH DRIVE AND COAST APPLY

Gregory J. Organek, Detroit; David M. Preston, Clarkston, and David A. Janson, Plymouth, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Original No. 5,485,904, dated Jan. 23, 1996, Appl. No. 08/189,366, Jan. 31, 1994. Application for reissue Dec. 19, 1997, Appl. No. 994,590.

Int. Cl.[7] **F16D** *13/04;27/112;43/20*

U.S. Cl. 192—35 **12 Claims**



1. A ball ramp mechanism for coupling two rotating elements comprising:

an input element driven by a prime mover and rotating about an axis of rotation;

an output element having an axis of rotation coaxial with said axis of rotation of said input element for rotating an output device;

a first ball ramp actuator for generating an axial movement comprising: an annular control ring adapted to be magnetically coupled to said output element and to rotate therewith, said control ring having at least two circumferential control ramps formed in a first face of said control ring, said control ramps varying in axial depth, an equivalent number of rolling elements one occupying each of said ramps, an activation ring having an axis of rotation along said axis of rotation of said control ring, said activation ring having at least two activation ramps substantially identical in number, shape and **[**a dial**]** *radial* position to said control ramps in said control ring where said activation ramps at least partially oppose said control ramps and where each of said rolling elements is trapped between said activation ramp and a respective at least partially opposed control ramp, said control ring axially and rotationally movably disposed relative to said activation ring;

a second ball ramp actuator for generating an axial movement wherein said activation ring has a plurality of opposite acting circumferential activation coast ramps formed in a second face of said activation ring and substantially identical partially opposed plate ramps formed in a pressure plate where said plate ramps and said coast ramps have a variable depth with an equivalent number of rolling elements one occupying each pair of partially opposed ramps which roll along said coast ramps and said plate ramps and operate to axially displace the activation ring from the pressure plate when rotated in a relative direction opposite to the direction of rotation causing axial displacement of said first ball ramp actuator;

coupling means for rotatably joining said input element to said output element where said coupling means varies the degree of rotational **[**Coupling**]** *coupling* between said input element and said output element according to the axial position of said control ring relative to said activation ring, said coupling means comprising: a flywheel attached to said input element having a friction surface; a clutch disc having a first friction surface for frictionally reacting against said flywheel friction surface and a second friction surface; said pressure plate having a friction surface for frictionally reacting against said clutch disc second friction surface where said pressure plate is nonrotatably connected to said flywheel;

a locking ring nonrotatably attached to said output element;

a control support element disposed between said control ring and said locking ring, said control support rotatably supported by said output element;

a coil for creating a magnetic field in said locking ring and said control ring and said control support thereby magnetically joining said control ring to said output element, **[**Said**]** *said* coil being electrically energized by a clutch control unit where said activation ring rotates with said input element and said control ring rotates with said output element according to said control means;

control clutch means for limiting the rotation of said activation ring relative to said control ring when said coil is energized, said clutch means attached to said control support and to said activation ring.

Re. 36,503

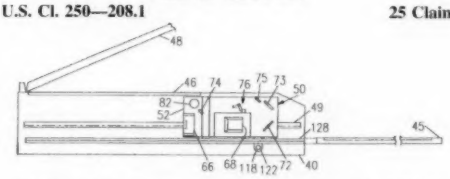
TRANSMISSIVE/REFLECTIVE OPTICAL SCANNING APPARATUS

John S. Rubley, Redondo Beach, and Loi Han, Alhambra, both of Calif., assignors to Microtek International, Inc., Redendo Beach, Calif.

Original No. 5,574,274, dated Nov. 12, 1996, Appl. No. 08/393,112, Feb. 21, 1995. Application for reissue Nov. 11, 1998, Appl. No. 189,921.

Int. Cl.[7] **H04N** *1/04*

U.S. Cl. 250—208.1 **25 Claims**



16. An optical scanning apparatus for retrieving digital images representative of opaque and transmissive objects comprising:

a scanner housing;

a reflective scanning platform formed in the upper surface of said scanner housing and including a glass platen upon which said opaque object is positioned;

a removable transmissive scanning platform;

a docking port formed in the side of said scanner, said docking port receiving said removable transmissive scanning platform;

a scanning camera movably positioned relative to said reflective scanning platform and including a digital camera, a lens and an optical pathway which are oriented to selectively view said platforms and generate electrical signals representative of the images viewed;

a motor adapted to move said scanning camera along a lengthwise path within said housing;

a controller circuit which is connected to said scanning camera, adapted to activate said scanning camera, such that upon activating said scanning camera, receive said scanning camera electrical signals, said circuit also connected to said motor and adapted to control the movement of said scanning camera through operation of said motor; and

said digital camera being aligned with the lens to view images from the optical pathway and the optical pathway being selectively aligned with said reflective scanning platform in a reflective scanning mode such that said control circuit receives images representative of said opaque object and aligned with said transmissive scanning mode such that said control circuit receives images representative of said transmissive object.

Re. 36,504

Patent Not Issued For This Number

Re. 36,505

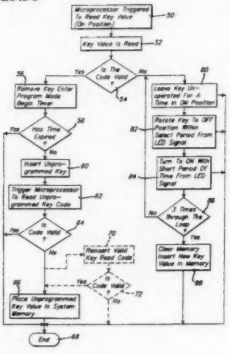
METHOD AND APPARATUS FOR PROGRAMMING A SPARE KEY INTO A SECURITY SYSTEM

William David Treharne, Farmington Hills, and Ronald Gerard Moore, Troy, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Original No. 5,508,694, dated Apr. 16, 1996, Appl. No. 08/357,960, Dec. 16, 1994. Continuation of application No. 08/669,201, Sep. 23, 1996, abandoned, which is a division of application No. 07/993,759, Dec. 21, 1992, Pat. No. 5,416,471. Application for reissue Aug. 6, 1997, Appl. No. 907,035.

Int. Cl.[7] H04Q *1/00*

U.S. Cl. 340—825.31 **4 Claims**



1. A method for reprogramming a security system having light means for providing feedback to a system operator, a lock having at least a first position and a second position, a timer and a memory at accept a key having an electronic security code, comprising the steps of:

inserting a key in said lock in a first position whose electronic security code has not been previously stored in said memory;

moving said key in said lock to a second position for a first time period;

[illuminating**]** *changing an illumination from* said light means **[**after**]** *to signal the end of* said first time period;

moving said key in said lock back to said first position within a second time period from **[**illumination of**]** *said changing of said illumination from* said light means; *and*

[clearing said memory of all previously stored security codes;**]**

storing the electronic security code of said inserted key in said memory**[**; and

storing a second electronic security code in said memory in response to receiving said first electronic security code**]**.

Re. 36,506

ANTENNA DESIGN USING A HIGH INDEX, LOW LOSS MATERIAL

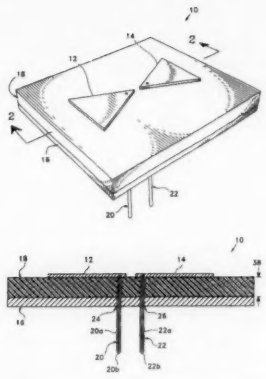
Richard C. Dempsey, Chatsworth, Calif.; Daniel W. Drago, Beaver Creek, Ohio, and Carl O. Jelinek, Camarillo, Calif., assignors to California Microwave, Woodlane Hills, Calif.

Original No. 5,563,616, dated Oct. 8, 1996, Appl. No. 08/210,829, Mar. 18, 1994. Application for reissue Oct. 8, 1998, Appl. No. 168,826.

Int. Cl.[7] H01Q *19/00*

U.S. Cl. 343—753 **13 Claims**

1. A device for use with radio or microwave frequency radiation including a predetermined frequency of interest, said device comprising:



at least one radiating element operatively coupled to radiation at said predetermined frequency of interest and

one or more layers of a transmission medium having dielectric and magnetic loss tangents each **[**substantially**]** less than 0.3 and matched values of relative permittivity and relative permeability **[**substantially**]** greater than 10 for said predetermined frequency of interest,

wherein the radiating element is oriented with respect to the transmission medium such that at least some of the radiation coupled to the radiating element is propagated through the transmission medium at a velocity less **[**that**]** *than* the velocity of said radiation in free space by a factor substantially equal to said relative permittivity.

Re. 36,507

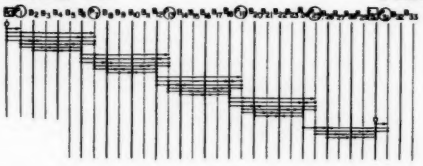
APPARATUS AND METHOD FOR PROCESSING GROUPS OF FIELDS IN A VIDEO DATA COMPRESSION SYSTEM TO ENCODE A SINGLE FRAME AS AN I-FIELD AND A P-FIELD

Siu L. Iu, Bensalem, Pa., assignor to Matsushita Electric Corporation of America, Osaka, Japan

Original No. 5,293,229, dated Mar. 8, 1994, Appl. No. 07/859,145, Mar. 27, 1992. Application for reissue Oct. 21, 1997, Appl. No. 954,916.

Int. Cl.[7] H04N *7/32*

U.S. Cl. 348—415 **6 Claims**



17. A method of automatically encoding a sequence of video image frames, each frame including first and second fields designated odd and even fields, the method comprising the steps of:

encoding the first field of a first frame in the sequence of video image frames using video information in the first field exclusive of video infomation in any other field to produce an I-field;

decoding the encoded I-field to produce a decoded I-field;

predictively encodig the second field of the first frame using video information in the second field and in the decoded I-field independently of video information in either field of a frame which immediately follows the first frame in the image sequence to produce a P-field;

decoding the encoded P-field to produce a decoded P-field;

storing the decoded I-field and the decoded P-field; and

considering the video infornadon in the stored I- and P-fields, which together represent the odd and even fields of the first frame to produce a P-field of a subsequent frame.

Re. 36,508

METHOD OF AUTOMATICALLY MEASURING THE HORIZONTAL SCAN FREQUENCY OF A COMPOSITE SYNCHRONISM SIGNAL, AND AN ELECTRONIC CIRCUIT OPERATING IN ACCORDANCE WITH THE METHOD

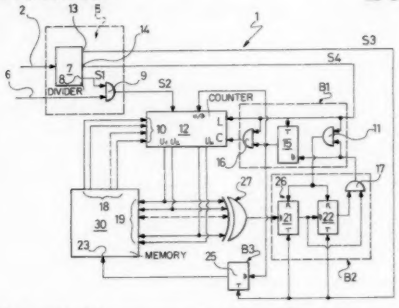
Silvano Gornati; Giorgio Betti, both of Milan; Fabrizio Sacchi; Gianfranco Vai, both of Pavia, and Maurizio Zuffada, Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate, Italy

Original No. 5,134,481, dated Jul. 28, 1992, Appl. No. 07/631,915, Dec. 21, 1990. Continuation of application No. 08/282,844, Jul. 28, 1994, abandoned. Application for reissue Sep. 17, 1997, Appl. No. 932,000.

Claims priority, application Italy, Dec. 21, 1989, 22782-A/89

Int. Cl.[7] H04N *5/08;5/04;7/01*

U.S. Cl. 348—558 **18 Claims**



10. A method for measuring the horizontal scan frequency of a composite synchronism signal, comprising the steps of:

(a) initially measuring the duration between adjacent synchronization pulses, to obtain a stored value therefrom; and thereafter

(b) intermittently comparing the duration between adjacent synchronization pulses to said stored value, to ascertain whether the duration between adjacent synchronization pulses is significantly different from said stored value; and

(c) repeating said step (b) intermittently, until said step (b) indicates, for a predetermined plurality of repetitions, that the duration between adjacent synchronization pulses is significantly different from said stored value, and then initiating a resynchronization process and performing said step (a).

Re. 36,509

TELEVISION SIGNAL TRANSMISSION AND RECEPTION SYSTEM WITH MULTI-SCREEN DISPLAY FOR TUNING OPERATION

Hideo Shigihara, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

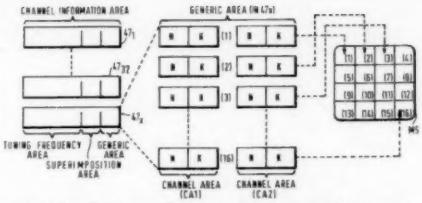
Original No. 5,537,153, dated Jul. 16, 1996, Appl. No. 08/145,217, Nov. 3, 1993. Application for reissue Jul. 15, 1998, Appl. No. 115,644.

Claims priority, application Japan, Nov. 16, 1992, 4-305532; Jun. 8, 1993, 5-137377

Int. Cl.[7] H04N *7/173*

U.S. Cl. 348—564 **27 Claims**

10. A method for transmitting image signals corresponding to a plurality of channels to a receiver having a display, said method comprising the steps of:



synthesizing the image signals to produce a multi-image signal having a plurality of sub-screens corresponding to the channels for the display;

generating a control signal having information for configuring attributes related to displaying the multi-image signal on the display including location of each sub-screen on the display and the channels corresponding to each of the sub-screens;

generating a mixed signal by mixing the image signals, the multi-image signal, and the control signal;

transmitting the mixed signal.

Re. 36,510

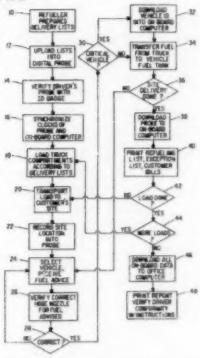
METHOD OF ON-SITE REFUELING USING ELECTRONIC IDENTIFICATION TAGS, READING PROBE, AND A TRUCK ON-BOARD COMPUTER

Robert R. Burns, 4705 Wilford Way, Edina, Minn. 55435

Original No. 5,579,233, dated Nov. 26, 1996, Appl. No. 08/370,097, Jan. 9, 1995. Application for reissue Mar. 5, 1997, Appl. No. 811,612.

Int. Cl.[7] G06F *17/60*

U.S. Cl. 364—479.01 **19 Claims**



19. A method for delivering petroleum or similar products from a delivery truck to the tanks of a plurality of vehicles located on a customer's site, through an elongated hose, the delivery truck having an accumulating gallonage meter and an on- board microprocessor, the microprocessor having a means for periodically sensing and recording readings of the gallonage meter at predetermined time intervals, comprising the steps of:

(a) affixing to the tank of each of the plurality of vehicles at the site a machine-readable identifier carrying encoded information;

(b) providing the driver of the delivery truck with a digital probe having a microprocessor and associated memory for storing the times upon which said digital probe is used to interrogate said machine-readable identifiers on said tanks;

(c) interrogating a machine-readable identifier affixed to the tank of one of the plurality of vehicles, and storing in the memory of said digital probe the information read from said machine-readable identifier, prior to dispensing fuel into the tank of the one vehicle;

(d) repeating step (c) for each of the plurality of vehicles to be refueled;

(e) *downloading the information stored in the memory of said digital probe into a computer along with gallonage meter readings from said on-board microprocessor of said delivery truck following step (d), and correlating in the computer the gallonage meter readings recorded by said on-board microprocessor with the times stored in the memory of said digital probe; and*

(f) *preparing a document reflecting the gallonage of fuel delivered to each of the plurality of vehicles.*

Re. 36,511

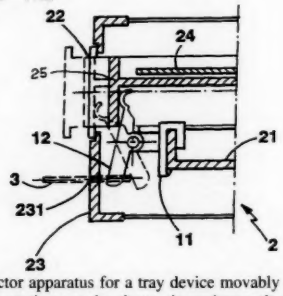
EJECTOR FOR A TRAY DEVICE

Dong-Yih Liou; Wen-Chi Tseng, and Chung-Chi Liao, all of Taoyuan, Taiwan, assignors to Acer Peripherals Inc., Taiwan

Original No. 5,561,653, dated Oct. 1, 1996, Appl. No. 08/337,941, Nov. 10, 1994. Application for reissue Oct. 1, 1998, Appl. No. 164,834.

Int. Cl.[7] **G11B** *33/02;17/04*

U.S. Cl. 369—77.1 **8 Claims**



1. An ejector apparatus for a tray device movably seated within an electronic equipment, the electronic equipment having a chassis and a front panel *with a hole*, the tray device having a front panel door **[**with a hole**]**, the ejector apparatus comprising:

a support having a hinge pin and a slot fixedly engaged to an edge of the chassis;

a generally plate-like arm element pivotally connected to the hinge pin of the support, the arm element having a first end and a second end, the first end acting as a pusher wherein in response to a force applied in a first direction on the second end of the plate-like arm element, the pusher of the plate-like arm element contacts the front panel door of the tray device to push, in a second direction, opposite to the first direction, the tray device out of the electronic equipment, the force applied to the second end of the arm element being applied by a user via a pin which passes through the hole.

Re. 36,512

METHOD OF FABRICATING AN ELECTROACOUSTIC TRANSDUCER

Takahiro Sone, Shizuoka, Japan, assignor to Star Micronics Co., Ltd., Shizuoka, Japan

Original No. 5,625,700, dated Apr. 29, 1997, Appl. No. 08/450,350, May 25, 1995. Application for reissue Dec. 14, 1998, Appl. No. 210,670.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H04R** *25/00;* **G08B** *3/00*

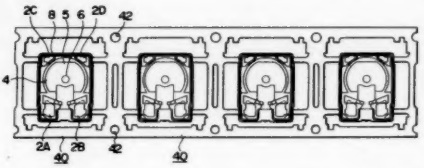
U.S. Cl. 381—396 **13 Claims**

6. A method of fabricating an electroacoustic transducer comprising the steps of:

forming pole piece portions;

forming a lead frame having a plurality of base forming areas thereon, each of said areas having lead terminals formed therein;

forming bases of a synthetic resin on said lead frame so that said lead terminals and pole piece portions are embedded in said bases;



mounting a coil on each of said pole piece portions embedded in said bases;

disposing a diaphragm with a given interval between itself and said pole piece portions;

connecting opposite ends of said coil to said lead terminals; and

cutting off said lead terminals from said lead frame.

Re. 36,513

GALLIUM SULFIDE GLASSES

Bruce G. Aitken, and Mark A. Newhouse, both of Corning, N.Y., assignors to Corning Inc., N.Y.

Original No. 5,392,376, dated Feb. 21, 1995, Appl. No. 08/225,767, Apr. 11, 1994. Application for reissue Dec. 17, 1996, Appl. No. 775,706.

Int. Cl.[7] **C03C** *3/23;4/10;13/04*

U.S. Cl. 385—144 **17 Claims**

16. A transparent glass exhibiting excellent transmission far into the infrared region of the electromagnetic radiation spectrum consisting essentially, expressed in terms of mole percent on the sulfide basis, of 40–80% Ga_2S_3, 0–35% RS_x, wherein R is at least one network forming cation selected from the group consisting of aluminum, antimony, arsenic, germanium, and indium, 1–50% Ln_2S_3, wherein Ln is at least one cation selected from the group consisting of a rare earth metal and yttrium, and 1–45% MS_x, wherein M is at least one modifying cation selected from the group consisting of barium, cadmium, calcium, lead, strontium, thallium, and tin, and 0–10% total chloride and/or fluoride.

Re. 36,514

POLE MOUNTED REVOLVING AIR CIRCULATING FAN

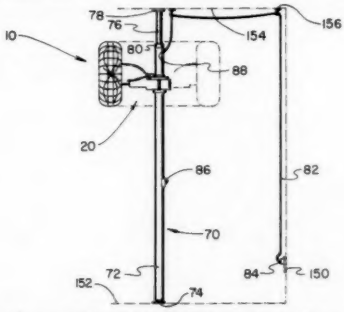
Michael L. Clark, South Fulton, Mo., assignor to Honeywell, Inc., Southborough, Mass.

Original No. 5,411,372, dated May 2, 1995, Appl. No. 08/214,577, Mar. 18, 1994. Application for reissue Apr. 30, 1997, Appl. No. 846,981.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **F04D** *29/36*

U.S. Cl. 416—110 **16 Claims**



2. **[**A pole mounted revolving**]** *An* air circulating fan *means* for inducing air movement within an air mass by use of a rotating impeller which **[**simultaneously revolves around**]** *moves about* a vertical axis, **[**the pole mounted**]** *said* air circulating fan *means* comprising:

a support pole extending substantially vertically upwardly from a mounting floor surface to a mounting ceiling surface, the ends of the support pole frictionally engaging the mounting surfaces [whereby] *thereby* wedging [the] *said support* pole in place to prevent unwanted movement [thereof] *of said support pole, said support pole including adjustment means for accommodating vertical adjustment of said support pole, and locking means for preventing said adjustment so as to maintain a selected length which facilitates frictional engagement of said support pole between the mounting floor and ceiling surface*;

an electric fan [revolvedly] *having a housing means rotatably* connected to [the vertical] *said* support pole such that [the] *said electrical* fan may [revolve around] *move in a path concentric to* the longitudinal axis of [the] *said support* pole; [and]

electro-mechanical drive means [for moving the] *directly coupled between said housing means and said support pole and adapted to move said electrical* fan [around the vertical] *on said path concentric to the axis of said* support pole *without the assistance of air pressure produced by rotation of the fan; and*

[a rotatable electrical contact assembly mounted on the fan; and]

[a stationary] *an* electrical [contact] *supply* assembly mounted on [the vertical] *said* support pole, *and connected* to [the] *said electrical* fan, the [stationary] *electrical supply* assembly [cooperating with the rotatable electrical contact assembly to supply] *for supplying* electrical energy to [the] *said electrical* fan as it [revolves around] *moves in the path concentric to the axis of* [the vertical] *said* support pole.

Re. 36,515

PROCESS FOR THE TREATMENT OF ASPARTAME

Hubertus J. M. Slangen, Stein, Netherlands, assignor to Holland Sweetener Company V.o.F., Maastricht, Netherlands

Original No. 5,411,747, dated May 2, 1995, Appl. No. 08/074,446, Jun. 10, 1993. Application for reissue Dec. 21, 1995, Appl. No. 575,877.

Claims priority, application Netherlands, Jun. 11, 1992, 9201029

Int. Cl.[7] **A61K** *9/14*

U.S. Cl. 424—489 **16 Claims**

6. A process for the treatment of dried aspartame comprising:

a first separation step in which particles smaller than 30 μm are removed, with the aid of a stream of air, from aspartame having a particle size distribution with which more than 5 wt. % of the aspartame has a particle size of less than 20 μm and more than 10 wt. % of the aspartame has a particle size of more than 400 μm, and

a second separation step in which the product resulting from the first step is subjected to a screening step using a screen that separates at a value between 150 and 250 μm, after which the fraction of the smaller particles thus obtained is recovered as a first product and the fraction of the larger particles is recovered as second product or is optionally subjected to a further separation step using a screen that separates at a value between 400 and 1000 μm, the fraction of smaller particles thus obtained being recovered as second product.

Re. 36,516

METHOD OF TREATING FLUIDS WITH A FILTER

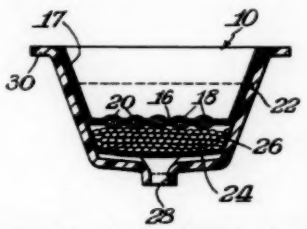
Robert Lehrer, Wilmington, Del., assignor to Robert Lehrer Associates, Inc., Wilmington, Del.

Original No. 5,567,461, dated Oct. 22, 1996, Appl. No. 08/239,581, May 9, 1994. Application for reissue Oct. 5, 1998, Appl. No. 166,509.

Int. Cl.[7] **A23D** *9/00;1/015;* **B01D** *39/00*

U.S. Cl. 426—417 **14 Claims**

1. A process for incorporating an additive in a fluid for enhancing the fluid comprising the steps of providing a fluid treating member in the form of upstream and downstream layers of material joined together to form a laminate having a fluid contacting



[surface] *region* with a plurality of spaced pockets between the layers of the material in the fluid contacting [surface] *region* and with the layers of material being fluid permeable at the pockets and with the upstream layer being liquid impermeable except at the pockets, mounting the treating member in a fluid applicating station, the permeability and impermeability characteristics of the upstream layer being inherent characteristics of the material used for the upstream layer whereby the permeability portions are self-permeable without requiring any piercing and alterations of the upstream layer to create fluid permeability, the upstream layer having its permeability and impermeability characteristics prior to mounting the treating member in the fluid applications station with the characteristics remaining unchanged both before and after the treating member is mounted in the fluid applicating station, the permeability and impermeability characteristics requiring the fluid to pass through the laminate by being confined to flowing through the pockets and with dissolvable additive material in the pockets dissolving in response to the fluid passing through the members, mounting the treating member in the path of fluid flow at a location spaced upstream from the collection area of the path of flow, directing the fluid against the upstream layer of the fluid contacting [surface] *region*, flowing a portion of the fluid laterally at the liquid impermeable portion of the upstream layer, flowing the fluid through the pockets of the treating member, dissolving the additive material by the action of the fluid contacting the additive material in the pockets, and incorporating the dissolved material in the fluid which passes out of the pockets and through the treating member and then flows to the collection area.

Re. 36,517

THIN FILM MAGNET, CYLINDRICAL FERROMAGNETIC THIN FILM AND PRODUCTION METHOD THEREOF

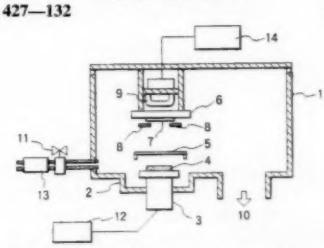
Takeshi Araki; Yoshihiro Tani; Hideo Ikeda, and Masashi Okabe, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 5,676,998, dated Oct. 14, 1997, Appl. No. 08/525,153, Sep. 8, 1995. Application for reissue Oct. 15, 1998, Appl. No. 172,876.

Claims priority, application Japan, Sep. 9, 1994, 6-216270

Int. Cl.[7] **B05D** *5/12*

U.S. Cl. 427—132 **15 Claims**



2. A method for producing an article comprising a thin film magnet by forming a thin film magnet on a substrate placed in a vacuum chamber, said thin film magnet comprising an $(Nd_{1-x}R_x)_yM_{1-y-z}B_z$ alloy having a ferromagnetic compound [comprising] *with an* $Nd_2Fe_{14}B$ *structure type* as its main phase, wherein R is at least one element selected from the group consisting of Tb, Ho, and Dy and M is Fe metal or an Fe-based alloy

including at least one element selected from the group consisting of Co and Ni, $0.04 \leqq x \leqq 0.10$, $0.11 \leqq y \leqq 0.15$, and $0.08 \leqq z \leqq 0.15$.

Re. 36,518

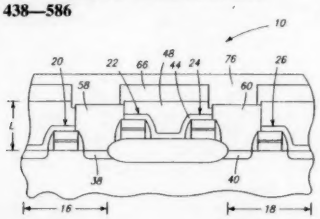
METHOD FOR MAKING ELECTRICAL CONTACT WITH AN ACTIVE AREA THROUGH SUB-MICRON CONTACT OPENINGS AND A SEMICONDUCTOR DEVICE

Charles H. Dennison, and Guy T. Blalock, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Original No. 5,229,326, dated Jul. 20, 1993, Appl. No. 07/902,374, Jun. 23, 1992. Application for reissue Jul. 20, 1995, Appl. No. 504,943.

Int. Cl.[7] **H01L** *21/44;21/48*

U.S. Cl. 438—586 **25 Claims**



17. A semiconductor processing method of making electrical contact with an active area on a semiconductor wafer, the method comprising the following steps:

providing a pair of conductive runners on a semiconductor wafer, individual conductive runners having sides;

providing an insulative layer on the sides of the conductive runners, the insulative sides of adjacent conductive runners being spaced a selected distance apart at a selected location on the wafer;

providing an active area between the conductive runners at the selected location;

providing a layer of first oxide to a selected thickness over the active area and conductive runners, the first oxide layer selected thickness being less than one-half the selected distance between the insulative sides of adjacent conductive runners;

providing a first planarized layer of insulating material atop the first oxide layer, the first layer of insulating material being selectively etchable relative to the first oxide, the first layer of insulating material having an upper surface;

patterning the planarized first insulating layer for definition of a first contact opening therethrough to the active area;

etching the patterned first insulating layer selectively relative to the first oxide layer to define the first contact opening therethrough, the first contact opening having an aperture width at the planarized first insulating layer upper surface, the aperture width being greater than the selected distance between the insulative sides of adjacent conductive runners;

etching the first oxide layer within the first contact opening to expose the active area; and

providing a plug of conductive material within the first contact opening over the exposed active area.

Re. 36,519

PLASTICIZERS FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Kin Kwong Lum, Webster; Christine J. T. Landry, Fairport, and Teh-Ming Kung, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 5,750,465, dated May 12, 1998, Appl. No. 08/670,312, Jun. 27, 1996. Application for reissue Apr. 22, 1999, Appl. No. 298,096.

Int. Cl.[7] **B41M** *5/035;5/38*

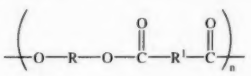
U.S. Cl. 503—227 **15 Claims**

6. A process of forming a dye transfer image comprising:

a) imagewise-heating *by means of a resistive head* a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a binder, and

b) transferring a dye image to a dye-receiving element to form said dye transfer image,

wherein said dye layer also contains a polymeric plasticizer having a Tg less than about 25° C., said plasticzer comprising



wherein:

R and R^1 each independently represent a substituted or unsubstituted linear or branched alkylene, phenylene or cycloalkylene group of from 1 to about 12 carbon atoms; and

n is an integer selected so that the plasticizer has a polystyrene equivalent weight average molecular weight of from about 18,000 to about 300,000.

Re. 36,520

HMG-COA REDUCTASE INHIBITORS

Robert L. Smith; Wasyl Halczenko; George D. Hartman, all of Lansdale; Gerald E. Stokker, Gwynedd Valley, all of Pa.; Edward S. Inamine, Rahway; Otto D. Hensens, Red Bank, both of N.J.; David R. Houck, Los Alamos, N. Mex., and Ta Jyh Lee, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

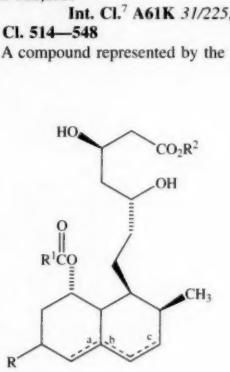
Original No. 5,116,870, dated May 26, 1992, Appl. No. 05/116,870, Jun. 6, 1990. Division of application No. 07/254,525, Oct. 6, 1988, Pat. No. 4,940,727, which is a continuation-in-part of application No. 07/092,353, Sep. 2, 1987, abandoned, and application No. 07/048,136, May 15, 1987, abandoned, which is a continuation-in-part of application No. 07/001,933, Jan. 9, 1987, abandoned, which is a continuation-in-part of application No. 06/877,041, Jun. 23, 1986, abandoned. Application for reissue Nov. 4, 1998, Appl. No. 188,155.

Int. Cl.[7] **A61K** *31/225;* **C07C** *69/74*

U.S. Cl. 514—548 **29 Claims**

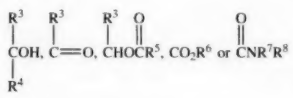
1. A compound represented by the following structural formula II:

(II)



wherein:

R is



R^1 and R^5 are independently:

(1) $C_{1\text{-}10}$ alkyl;

(2) substituted $C_{1\text{-}10}$ alkyl in which one or more substituent(s) is:

(a) halogen,

(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkylS(O)$_n$ in which n is 0 to 2,
(j) C_{3-8} cycloalkylS(O)$_n$,
(k) phenylS(O)$_n$,
(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(3) C_{1-10} alkoxy;
(4) C_{2-10} alkenyl;
(5) C_{3-8} cycloalkyl;
(6) substituted C_{3-8} cycloalkyl in which one substituent is:
(a) C_{1-10} alkyl
(b) substituted C_{1-10} alkyl in which the substituent is selected from
(i) halogen,
(ii) hydroxy,
(iii) C_{1-10} alkoxy,
(iv) C_{1-5} alkoxycarbonyl,
(v) C_{1-5} acyloxy,
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y
(viii) C_{1-10} alkylS(O)$_n$,
(ix) C_{3-8} cycloalkylS(O)$_n$,
(x) phenylS(O)$_n$,
(xi) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(xii) oxo,
(c) C_{1-10} alkylS(O)$_n$,
(d) C_{3-8} cycloalkylS(O)$_n$,
(e) phenylS(O)$_n$,
(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C_{1-10} alkoxy,
(j) C_{1-5} alkoxycarbonyl,
(k) C_{1-5} acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(7) phenyl;
(8) substituted phenyl in which the substituents are X and Y;
(9) amino;
(10) C_{1-5} alkylamino;
(11) di(C_{1-5} alkyl)amino;
(12) phenylamino;
(13) substituted phenylamino in which the substituents are X and Y;
(14) phenyl C_{1-10} alkylamino;
(15) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y;
(16) R^9S in which R^9 is selected from
(a) C_{1-10} alkyl,
(b) phenyl, and
(c) substituted phenyl in which the substituents are X and Y;

R^2 and R^6 are independently:
(1) hydrogen;
(2) C_{1-5} alkyl;
(3) substituted C_{1-5} alkyl in which the substituent is:
(a) phenyl,
(b) dimethylamino, and
(c) acetylamino, and
(4) 2,3-dihydroxypropyl;

R^3 and R^4 are independently:
(1) hydrogen;
(2) C_{1-10} alkyl;
(3) substituted C_{1-10} alkyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y.
(i) C_{1-10} alkylS(O)$_n$,
(j) C_{3-8} cycloalkylS(O)$_n$,
(k) phenylS(O)$_n$,
(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(4) C_{2-10} alkenyl;
(5) substituted C_{2-10} alkenyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkylS(O)$_n$,
(j) C_{3-8} cycloalkylS(O)$_n$,
(k) phenylS(O)$_n$,
(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(6) C_{3-8} cycloalkyl;
(7) substituted C_{3-8} cycloalkyl in which one substituent is:
(a) C_{1-10} alkyl
(b) substituted C_{1-10} alkyl in which the substituent is
(i) halogen,
(ii) hydroxy,
(iii) C_{1-10} alkoxy,
(iv) C_{1-5} alkoxycarbonyl,
(v) C_{1-5} acyloxy
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y
(viii) C_{1-10} alkylS(O)$_n$,
(ix) C_{3-8} cycloalkylS(O)$_n$,
(x) phenylS(O)$_n$,
(xi) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(xii) oxo,
(c) C_{1-10} alkylS(O)$_n$,
(d) C_{3-8} cycloalkylS(O)$_n$,
(e) phenylS(O)$_n$,
(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C_{1-10} alkoxy,
(j) C_{1-5} alkoxycarbonyl,
(k) C_{1-5} acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(8) phenyl;
(9) substituted phenyl in which the substituents are X and Y;

R^7 and R^8 are independently:
(1) hydrogen;
(2) C_{1-10} alkyl;
(3) substituted C_{1-10} alkyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-10} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkyl S(O)$_n$ in which n is 0 to 2,
(j) C_{3-8} cycloalkyl S(O)$_n$,
(k) phenyl S(O)$_n$;
(l) substituted phenyl S(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(4) C_{2-10} alkenyl;
(5) C_{3-8} cycloalkyl;
(6) aminocarbonyl;

(7) substituted aminocarbonyl in which one or more substituent(s) is:
(a) C_{1-5} alkyl,
(b) C_{3-8} cycloalkyl,
(c) phenyl,
(d) substituted phenyl in which the substituents are X and Y;
(8) phenyl;
(9) substituted phenyl in which the substituents are X and Y;
(10) C_{1-10} alkylcarbonyl;
(11) C_{3-8} cycloalkylcarbonyl;
(12) phenylcarbonyl;
(13) substituted phenylcarbonyl in which the substituents are X and Y; and

X and Y independently are hydrogen, halogen, trifluoromethyl, C_{1-3} alkyl, nitro, cyano or a group selected from:
(1) $R^{10}O(CH_2)_m$ in which m is 0 to 3 and R^{10} is hydrogen, C_{1-3}alkyl or hydroxy-C_{2-3}alkyl;
(2)

$$R^{11}\overset{O}{\overset{\|}{C}}O(CH_2)_m \text{ or } R^{11}O\overset{O}{\overset{\|}{C}}O(CH_2)_m$$

in which R^{11} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, phenyl, naphthyl, amino-C_{1-3}alkyl, C_{1-3}alkylamino C_{1-3}alkyl, di(C_{1-3}alkyl)amino-C_{1-3}alkyl, hydroxy-C_{2-3}-alkylamino-C_{1-3}alkyl or di(hydroxy C_{2-3}alkyl) amino-C_{1-3}alkyl;
(3)

$$R^{12}O\overset{O}{\overset{\|}{C}}(CH_2)_m$$

in which R^{12} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, C_{1-3}alkoxy-C_{1-3}alkyl, phenyl or naphthyl;
(4)

$$R^{13}R^{14}N(CH_2)_m,\ R^{13}R^{14}N\overset{O}{\overset{\|}{C}}(CH_2)_m \text{ or } R^{13}R^{14}N\overset{O}{\overset{\|}{C}}O(CH_2)_m$$

in which R^{13} and R^{14} independently are hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}aikyl;
(5) $R^{15}S(O)_n(CH_2)_m$ in which R^{15} is hydrogen, C_{1-3}alkyl, amino, C_{1-3}alkylamino or di(C_{1-3}alkyl)amino; and

a, b and c each represent single bonds or one of a, b and c represents a double bond or both a and c represent double bonds; or a pharmaceutically acceptable salt thereof.

Re. 36,521

CONNECTING PART BETWEEN LEG PROSTHESIS COMPONENTS

Christian Hiemisch, Duderstadt, Germany, assignor to Otto Bock Orthopaedische Industrie Besitz - und Verwaltungs KG, Duderstadt, Germany

Original No. 5,405,406, dated Apr. 11, 1995, Appl. No. 08/041,242, Apr. 1, 1993. Application for reissue Oct. 15, 1996, Appl. No. 730,210.

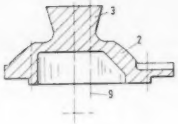
Claims priority, application Germany, Apr. 1, 1992, 92 04 448 U

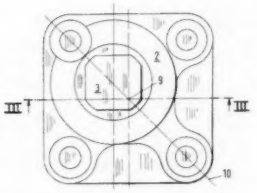
Int. Cl.[7] **A61F** *2/62*

U.S. Cl. 623—38 **9 Claims**

8. A connecting part of a ball joint for connecting first and second leg prosthesis components comprising:

a flange having a central axis and four holes, the holes extending through the flange; and





an adjusting element set upon the flange, the adjusting element including a cup and a four-sided pyramid having an apex, the apex being positioned centrally upon the cup to define an adjusting element central axis that is substantially parallel to and offset from the central axis of the flange;

wherein the flange and the adjusting element are contiguous;

wherein the four holes are positioned in the flange at corners of a rectangular pattern that lies orthogonal to the central axis of the flange.

Re. 36,522

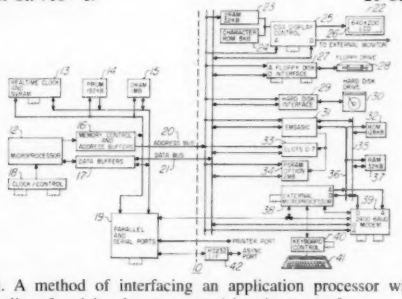
METHOD AND APPARATUS FOR DYNAMICALLY INTERFACING WITH A PLURALITY OF PERIPHERAL PORTS

Steven J. Wallace, and LaVaughn F. Watts, Jr., both of Austin, Tex., assignors to Texas Instruments Incoporated

Original No. 5,745,788, dated Apr. 28, 1998, Appl. No. 08/494,863, Jun. 26, 1995. Continuation of application No. 08/196,046, Feb. 14, 1994, abandoned, which is a continuation of application No. 07/424,853, Oct. 20, 1989, Pat. No. 5,317,707. Application for reissue Sep. 30, 1998, Appl. No. 177,447.

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 710—19 **20 Claims**



1. A method of interfacing an application processor with a plurality of peripheral ports, comprising the steps of:

monitoring the plurality of peripheral ports with an external processor;

communicating a status change in at least one of the plurality of peripheral ports to the application processor;

evaluating the status change with the application processor;

executing a response with the application processor in response to the status change; and

communicating the status change evaluation and execution from the application processor to the external processor.

PLANT PATENTS

GRANTED JANUARY 18, 2000

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

11,181

CYNODON DACTYLON PLANT NAMED 'RILEY'S SUPER SPORT'

Rodney J. Riley, 49 Iris Street, Guilford, New South Wales, 2161, Australia

Filed Jul. 31, 1997, Appl. No. 903,947
Int. Cl.[7] A10H *5/00*

U.S. Cl. Plt.—389 **1 Claim**

1. A new and distinct variety of *Cynodon dactylon* plant named 'Riley's Super Sport', substantially as described and illustrated.

11,182

APPLE TREE NAMED 'STIEKEMA 1'

Paul Stiekema, 3961 Barrett Dr., Hood River, Oreg. 97031

Filed Oct. 2, 1997, Appl. No. 942,861
Int. Cl.[7] A01H *5/00*

U.S. Cl. Plt.—162 **1 Claim**

1. A new and distinct variety of apple tree substantially as herein shown and described.

11,183

STRAWBERRY PLANT NAMED 'YAEL'

Eva Izsak, and Shamai Izhar, both of Rehovot, Israel, assignors to State of Israel, Ministry of Agriculture, Agricultural Research Organization, Bet Dagan, Israel

Filed Nov. 14, 1997, Appl. No. 968,823
Int. Cl.[7] A01H *5/00*

U.S. Cl. Plt.—208 **1 Claim**

1. A new distinct variety of strawberry plant substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in November and lasting until summer, with fruit having a good taste and shape.

11,184

HYBRID TEA ROSE PLANT NAMED 'DELVERBLA'

Guy Delbard, Hyéres, France, assignor to Société Anonyme des Pépiniéres et Roseraies Georges Delbard, Commentry, France

Filed Jan. 12, 1998, Appl. No. 5,576
Int. Cl.[7] A01H *5/00*

U.S. Cl. Plt.—133 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) from a physical point of view forms green mature wood, assumes a bushy growth habit, and forms attractive long-lasting flowers having consistent petals that are greenish-white at the bud stage and finish to white when completely open, and

(b) from the biological point of view forms semi-vigorous vegetation, produces flowers in abundance, exhibits the ability readily to be forced, and is very resistant to diseases when grown under greenhouse conditions;

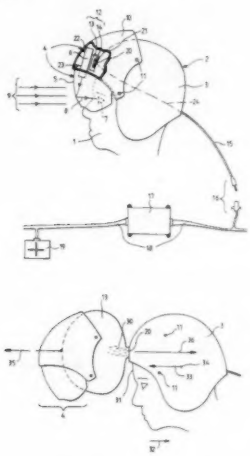
substantially as herein shown and described.

PATENTS

GRANTED JANUARY 18, 2000

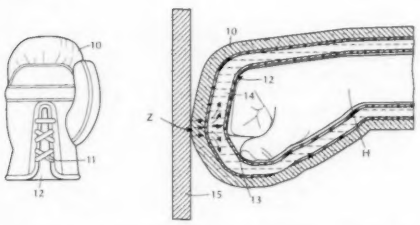
GENERAL AND MECHANICAL

6,014,769
HELMET COMPRISING A PART THAT IS JETTISONABLE BY MEANS OF AN INFLATABLE CUSHION
Joël Baudou, St Medard En Jalles, and Alain Leger, Merignac, both of France, assignors to Sextant Avionique, Velizy Villacoublay, France
Filed Dec. 11, 1998, Appl. No. 209,478
Claims priority, application France, Dec. 12, 1997, 97 15777
Int. Cl.[7] A42B *3/00*
U.S. Cl. 2—6.1 **10 Claims**



1. A helmet comprising a part that is jettisonable in an emergency, comprising, firstly, an inflatable cushion inserted between a shell of the helmet and the jettisonable part and, secondly, means to rapidly inflate the cushion so as to separate the jettisonable part from the shell.

6,014,770
BOXING TRAINING GLOVES
Donald Spector, 380 Mountain Rd., Union City, N.J. 07080
Filed Oct. 1, 1998, Appl. No. 164,996
Int. Cl.[7] A41D *13/08*
U.S. Cl. 2—18 **7 Claims**

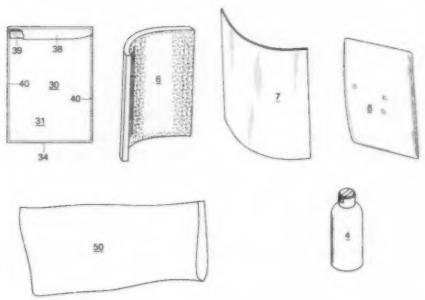


1. A training glove used in combination with a hard surface and having characteristics of a heavy bag whereby when a boxer wearing the glove on his hand repeatedly punches said hard surface, this action builds up his muscular strength, said glove comprising:

A. a heavily-padded fingerless mitten having a contoured interior; and

B. a liner for the mitten conforming to the interior of the mitten, said liner being composed of a sealed plastic film envelope, and a compressible liquid filling the envelope whereby when the glove punches the hard surface to produce at a zone of contact an impact force which is conveyed to the liner, the liquid therein then acts to disperse this force to prevent injury to the hand of the boxer.

6,014,771
KNEE PROTECTION KIT
Marie Kirven, 19 Fabyan Rd., Plymouth, Mass. 02360
Filed Feb. 3, 1999, Appl. No. 244,547
Int. Cl.[7] A41D *13/00;27/20*
U.S. Cl. 2—23 **9 Claims**



1. A knee protection kit for use in combination with pants having a waistband, a crotch area, a right leg member, a left leg member, said leg members extending along an outseam from the waistband to an ankle end, and along an inseam from the crotch area to an ankle end, each said leg member having a front knee area located between the crotch area and the ankle end, said pants having an exterior surface and an interior surface, comprising:

two separate fabric pockets, each said pocket having a front surface, a rear surface, a top, a bottom, two sides and an interior, said pocket interior being accessible by a flap opening along an edge thereof;

a container filled with a liquid fabric glue and for attaching each of said fabric pocket rear surface to a pants front knee area;

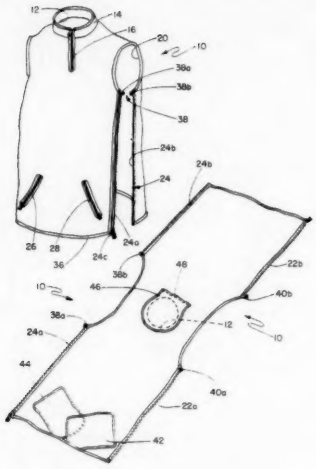
a pair of insert resilient pads, each of said resilient pads fitted into the respective pocket interior;

a pair of insert hard shells, each of said hard shells being adapted to being fitted into a pocket interior; and

a pair of soft wool pads, wherein the soft wool pads are attachable to the respective pocket front surface when the pocket is attached to the interior surface of the pants, and wherein the soft wool pads are attachable directly to the interior surface of the pants' front knee area when the pocket is attached to the exterior surface of the pants.

6,014,772
MULTI-PURPOSE CONVERTIBLE GARMENT WITH ADJUSTABLE SIDE VENTS
Martin P. Connelly, 20722 Highway 2 West, East Glacier, Mont. 59434
Filed Aug. 25, 1997, Appl. No. 921,869
Int. Cl.[7] A41B *1/00*
U.S. Cl. 2—69 **8 Claims**

1. A garment comprising:



a single piece of fabric adapted for folding over the shoulders of a wearer of the garment so as to form front and back portions respectively disposed over the front and back of the wearer's torso;

first means in said single piece of fabric for defining a neck opening for receiving the head and neck of the wearer;

right and left continuously adjustable closure means, each having respective upper and lower ends, for connecting adjacent front and back portions of the garment, wherein said closure means are adapted for assuming open and closed positions and a continuous range of positions intermediate therebetween;

second and third means in said single piece of fabric for defining right and left arm openings, wherein said right and left arm openings are disposed at respective upper ends of said right and left closure means for permitting the garment to be worn as a vest when said closure means are closed and for permitting the garment to be worn as a poncho when said closure means are open, and wherein intermediate positions of said right and left closure means provide side venting for the garment when worn as a vest; and

right and left clasps respectively disposed between an upper end of said right closure means and said right arm opening and between an upper end of said left closure means and said left arm opening to provide a snug fit of the garment about the shoulders of the wearer when worn as a vest or as a poncho.

6,014,773

MONITORED STATIC ELECTRICITY DISSIPATION GARMENT

David L. Banks, 7362 W. 87th St., Los Angeles, Calif. 90045

Filed Dec. 10, 1998, Appl. No. 208,366

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H05F** *3/02;* **A41D** *13/02*

U.S. Cl. 2—69 **16 Claims**

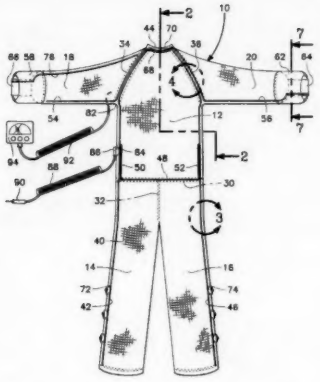
1. A monitored static dissipation garment for a wearer comprising:

a front section adapted to be placed against the front of a wearer;

a back section adapted to be placed against the back of a wearer, said front section being attached to said back section;

said front section and said back section including a mass of electrically conductive threads;

a grounding circuit for discharging static electricity, said grounding circuit located on said back section; and



a monitoring circuit for detecting the level of static electricity on said garment, said monitoring circuit located on said front section.

6,014,774

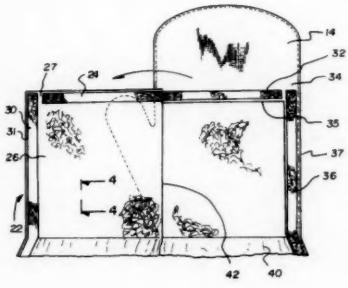
MITTEN HAVING A RETRACTABLE BACK PORTION

Martha Davey, and Steven Drozd, both of 780 Mohawk Rd. West #1017, Hamilton, Canada, L9C 6P7

Filed Jul. 1, 1998, Appl. No. 108,758

Int. Cl.[7] **A41D** *19/01*

U.S. Cl. 2—158 **6 Claims**



1. A mitten for a hand comprising:

a palm portion having an outside layer, an inner layer, and an inside layer;

a back portion consisting of an upper back portion and a lower back portion each having an outside layer, an inner layer, and an inside layer, the back portion and palm portion being peripherally attached to define a cavity therebetween, the cavity having a thumb section for receiving a thumb of the hand and an opening for receiving the hand therethrough, the lower back portion consisting of a lateral portion and an integrally hinged flap portion, having an upper edge, a lower edge, an affixed side edge, and a free side edge;

a first fastening means fixedly attached proximate the upper edge of the flap portion inside layer; and

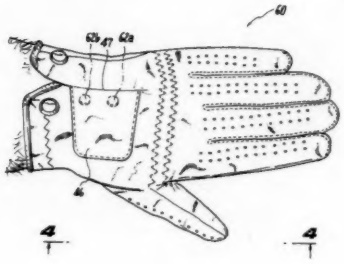
a second fastening means fixedly attached proximate the free side edge of the flap portion inside layer, the first fastening means being releasably attachable to a third fastening means fixedly attached proximate a lower edge of the upper back portion outside layer and the second fastening means being releasably attachable to a fourth fastening means fixedly attached proximate the lateral portion of the back portion outside layer.

6,014,775

MAGNETIC GOLF GLOVE

Ezra Missry, Deal, N.J., assignor to Misco Enterprises, Inc., Dunellen, N.J.

Filed May 3, 1999, Appl. No. 303,594
Int. Cl.[7] A41D *19/00*
U.S. Cl. 2—161.2 7 Claims



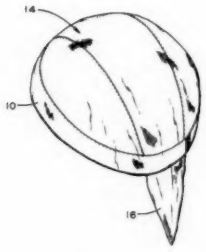
1. An improved golf glove of a type having a back hand engaging portion for engaging the back of the hand, a wrist engaging portion for engaging the wrist, a throughslot that extends longitudinally along the back of the hand portion, a fastening flap fixedly attached at a fixed edge to the back of the hand portion along one side of the throughslot and extending therefrom over the throughslot to the back of the hand portion on the other side of the throughslot where it is selectively maintained thereagainst, said improvement comprising a first and second magnet contained in the fastening flap.

6,014,776

BANDANNA-LIKE HEADPIECE

John J. DeVinzio, 956 Broadway Ave., East Mckeesport, Pa. 15035

Filed Jan. 5, 1999, Appl. No. 225,435
Int. Cl.[7] A42B *5/00*
U.S. Cl. 2—207 5 Claims



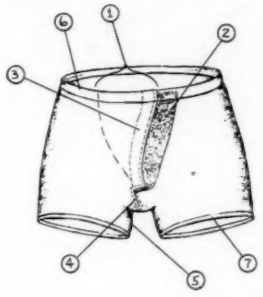
1. A decorative head piece comprising an elongated strip piece of cloth having a fastener means at each end so that the two ends of the strip piece of cloth can be joined together to form a closed loop that can be fitted around a person's head, and a generally hemispherical piece of cloth permanently attached to a top edge of said strip piece of cloth such that the generally hemispherical piece of cloth will overlay the top portion of a person's head when said closed loop is fitted therearound, and such that the closed loop and hemispherical portion fit tightly against the persons head, said hemispherical piece of cloth having a tail, or tapered end portion adapted to hang downwardly adjacent to said fastener means when joined together.

6,014,777

UROLOGICAL ACCESS UNDERGARMENT

Kenneth Gupton, 9535 Fairmead Dr., Charlotte, N.C. 28269

Provisional application No. 60/050,621, Jun. 24, 1997. This application Jun. 24, 1998, Appl. No. 103,893.
Int. Cl.[7] A41B *9/00*
U.S. Cl. 2—400 1 Claim



1. An undergarment for hospital, nursing home and home-care use which comprises:

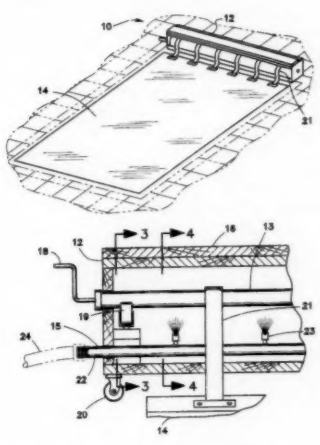
an undergarment having a front, rear, a waist and a crotch; said undergarment having a vertical catheter slit extending from a bottom of the crotch upward to a top of said crotch thereby allowing the insertion of a catheter, and a vertical access opening located and extending directly above said catheter slit to said waist and wherein said opening has two strips of mating corresponding passive and aggressive hook and loop fasteners to open and close said opening when said garment is worn.

6,014,778

POOL COVER SYSTEM

Albert D. Varnado, 3109 Poinsettia Ave., Manhattan Beach, Calif. 90266

Filed Apr. 15, 1999, Appl. No. 292,577
Int. Cl.[7] E04H *4/00*
U.S. Cl. 4—502 7 Claims



7. A pool cover system comprising in combination:

an elongate housing having a shaft extending along a longitudinal axis thereof;

a pool cover coupled to said shaft, said pool cover wrapping around said shaft when said shaft rotates;

a sprayer system positioned in said housing and adapted for spraying an outer surface of said cover as said cover is wrapped around said shaft;

said housing having a front door pivotally coupled to an upper edge of an open face of said housing;

said shaft having a hand crank extending from an end thereof;

said shaft rotatably resting on opposite pairs of rollers;

said cover having a plurality of straps extending from an end thereof, said straps being fixedly coupled to said shaft;

said sprayer system including a supply pipe extending generally parallel said longitudinal axis of said housing and positioned below said shaft; and

said supply line having a plurality of nozzles extending therefrom towards said shaft, said nozzles being adapted for spraying fluid onto said cover.

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6,014,779

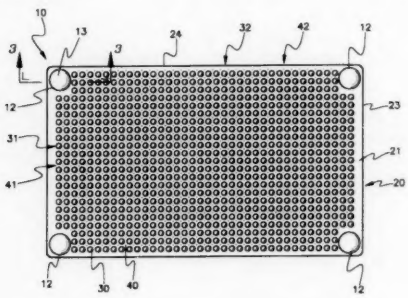
SHOWER AND BATH MAT

Venicia Lindholm, 1928 S. Sherbourne Dr. #9, Los Angeles, Calif. 90034

Filed Mar. 19, 1998, Appl. No. 44,312

Int. Cl.[7] A47K *3/02*

U.S. Cl. 4—583 **13 Claims**



1. A shower and bath mat, comprising:

a mat member being generally rectangular and having upper and lower surfaces, a pair of short sides, a pair of long sides and a plurality of corners;

said upper surface of said mat member having a plurality of generally rounded nodules extending therefrom;

said mat member having a plurality of generally cylindrical apertures extending therethrough between said upper and lower surfaces of said mat member;

a plurality of suction cups, each corner of said mat member having a said suction cup located theretowards, each of said suction cups having a rounded upper portion, a lower rim, and a concavity directed from said upper portion of said suction cup towards said lower rim portion of said suction cup, said upper portion of said suction cup being extended from said upper surface of said mat member, said lower rim being extended from said lower surface of said mat member;

wherein said short sides of said mat member define a mat length therebetween; wherein said long sides of said mat member define a mat width therebetween;

wherein said mat width is less said mat length and greater than ½ of said mat length; and

wherein said nodules each have a top and a root, said root being positioned adjacent said upper surface, wherein said top of said nodules and said upper surface of said mat member define a nodule height therebetween, wherein said nodule height is less than about 3/16 inch, wherein said root of said nodule has a diameter, wherein said diameter of said nodule is less than about ½ inch, wherein each said aperture has a diameter, wherein said diameter of said aperture is about 1/32 inch.

6,014,780

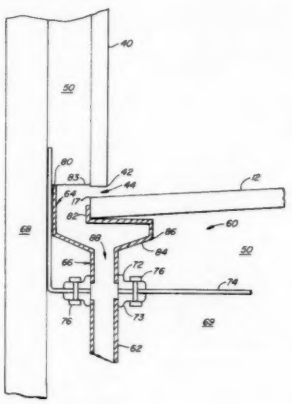
SHOWER BATH AND DRAIN

Waldemar Robert Jurek, Concord, and Arthur Puchalski, San Francisco, both of Calif., assignors to Eagle Natural Stone, San Francisco, Calif.

Division of application No. 09/072,271, May 4, 1998, Pat. No. 5,911,518. This application Mar. 2, 1999, Appl. No. 260,120.

Int. Cl.[7] A47K *3/22*

U.S. Cl. 4—613 **6 Claims**



1. A shower drain for guiding water from a discharge gap, which is formed along a line of joint between a side edge of a substantially planar shower floor of a shower bath and a lower edge of a shower wall spaced above the side edge, to a drain pipe disposed under the shower floor, the shower drain comprising:

an upper channel portion having a rear channel wall for cooperating with the lower edge of the shower wall, a front channel wall horizontally spaced from the rear channel wall for cooperating with the side edge of the shower floor, and a channel bottom connecting the rear channel wall with the front channel wall, the channel bottom having a drain opening, wherein the upper channel portion extends across a portion of a length of the discharge gap;

at least one channel wing coupled to an end of the upper channel portion and extending along a remaining length of the discharge gap;

a lower conduit portion extending downwardly from the drain opening of the channel bottom, so that water collected in the upper channel portion can flow through the lower conduit portion to the drain pipe.

6,014,781

PORTABLE JUVENILE CRIB

Richard E. Cone, II, Athens, Ohio, assignor to Cosco, Inc., Columbus, Ind.

Provisional application No. 60/066,218, Nov. 20, 1997. This application Oct. 7, 1998, Appl. No. 168,234.

Int. Cl.[7] A47D *7/01;7/03*

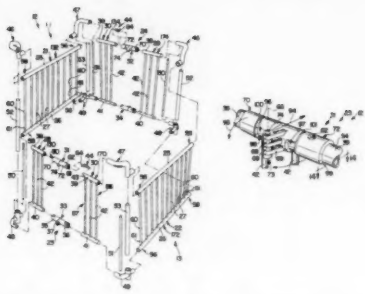
U.S. Cl. 5—99.1 **35 Claims**

1. A juvenile crib frame comprising

a first frame portion,

a second frame portion, and

a lock mechanism having a first member mounted for rotation on the first frame portion, a second member mounted for rotation on the second frame portion, and a hinge pin that couples the first member to the second member for pivotable movement of the first member relative to the second member about an axis defined by the hinge pin that is perpendicular to the axis



of rotation of at least one lock mechanism member relative to its companion frame portion.

6,014,782

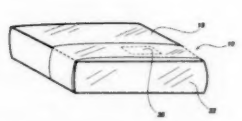
PROTECTIVE MATTRESS COVER

Anna Stevenson, North Salt Lake, Utah, assignor to Dream World Design, Salt Lake City, Utah

Provisional application No. 60/045,934, May 8, 1997. This application Nov. 17, 1997, Appl. No. 971,349.

Int. Cl.[7] **A47G** *9/04*

U.S. Cl. 5—499 **19 Claims**



1. A removable mattress cover comprising:

a generally elongate web of flexible clear polymeric material dimensioned and configured to wrap around a foot portion of a mattress hich is at least 8 inches thick, wherein the web has a first end and a second end, and wherein the web is sufficiently long to enable the first and second ends to overlap each other a distance which varies depending on the size of the mattress when the web is wrapped around the foot portion of a mattress; and

means for adjustably securing the web to itself at its overlapping first and second ends at an overlap distance which varies depending on the size of the mattress.

6,014,783

RIGID BACKED PNEUMATIC CUSHION FOR CONVALESCENT RECLINERS

David Collier; Clint Guillot, and Peter Harris, all of 719 C Burnside Ave., Gonzales, La. 70737

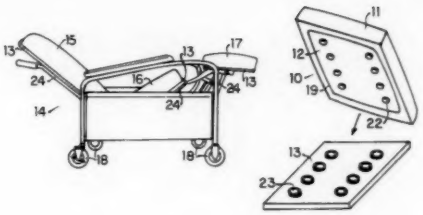
Filed Nov. 27, 1998, Appl. No. 200,705

Int. Cl.[7] **A61G** *7/015;7/05;* **A47C** *27/08*

U.S. Cl. 5—618 **9 Claims**

1. A structure intended to provide a support surface for a patient which is preventive of ischemia, said structure comprising:

a cushion, a cover, a substantially flat rigid base, and mechanical attachment means for directly attaching said cushion to said



substantially flat rigid base comprised of a plurality of upper attachment elements and a plurality of lower attachment elements;

said cushion comprising a plurality of vertically oriented pneumatic cells possessing a common pneumatic cell base from which each said pneumatic cell extends upwardly with said common pneumatic cell base disposed substantially horizontally;

said cover fitting over said plurality of vertically oriented pneumatic cells and about said common pneumatic cell base;

said substantially flat rigid base being fixedly attached to a subframe of a convalescent recliner possessing three subframes;

said plurality of upper attachment elements being presented by a bottom face of said common pneumatic cell base in a direction opposed to the extension of said plurality of vertically oriented pneumatic cells and further disposed upon said bottom face interior to a peripheral margin of said bottom face in a fixed configuration;

said plurality of lower attachment elements being presented by a top face of said substantially flat rigid base in a fixed configuration matching said fixed configuration of said plurality of upper attachment elements;

each of said plurality of upper attachment elements mating with one of said plurality of lower attachment elements;

whereby mating of each of said plurality of upper attachment elements with one of said plurality of lower attachment elements mechanically attaches said cushion to said substantially flat rigid base with said bottom face of said common pneumatic cell base disposed substantially flush with said top face of said substantially flat rigid base thereby allowing inclination of said structure without significant shifting of said cushion with respect to said substantially flat rigid base and fixedly attached to a subframe of a convalescent recliner and mechanical attachment of one said cushion to said substantially flat rigid base with said cover fitted over said plurality of vertically oriented pneumatic cells and said common pneumatic cell base provides an ischemic preventive support surface for a patient which will not shift significantly with inclination of the same.

6,014,784

PORTABLE SYSTEM FOR GENERATING VARIABLE PRESSURE POINT BODY SUPPORT

Rex E. Taylor, 439 W. F St., Dixon, Calif. 95620-2802, and Thomas W. Christopherson, 451 Bellwood Dr., Santa Clara, Calif. 95054

Filed Oct. 19, 1998, Appl. No. 175,103

Int. Cl.[7] **A61G** *7/04*

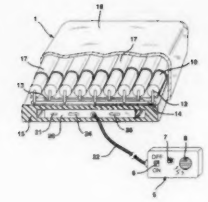
U.S. Cl. 5—713 **12 Claims**

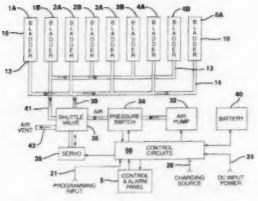
1. A system for generating constantly changing pressure points for a cushion supporting a person or animal, said system, in combination comprising;

(a) a rigid support member;

(b) a first bladder array comprising a multiplicity of inflatable bladders which are arranged in rows and supported by said support member;

(c) a second bladder array comprising a multiplicity of inflatable bladders which are arranged with each bladder located alter-





nately between the rows of said first bladder array and supported by said support member;

(d) a multiplicity of cloth covers; a cover separately covering each bladder in said first bladder array and in said second bladder array, said covers being fastened to said support member and sized to contain a fully inflated bladder under each cover;

(e) a first air manifold for supplying said first bladder array, all bladders in said first bladder array being connected in parallel to said first air manifold;

(f) a second air manifold for supplying said second bladder array, all bladders in said second bladder array being connected in parallel to said second air manifold;

(g) air pump means for supplying regulated pressured air to said first air manifold and said second air manifold;

(h) means for switching pressured air input from said air pump means to said first air manifold or to said second air manifold on command, for air inflation of said bladders;

(i) means for bleeding pressured air from said first air manifold and said second air manifold on command;

(j) a rechargeable battery power supply, said battery power supply being sized to supply at least 16 hours system operating time before need to be recharged;

(k) first means for system control, said first means including control circuits comprising:

a power on/off switching circuit;

a voltage regulator circuit which is enabled by said power on/off switching circuit;

second means for timing and cycling control, said second means including a re-programable microprocessor that is programed for controlling the inflation cycling of the bladders in said first bladder array and said second bladder array in any pre-determined sequence and time intervals to vary the pressure and points of support applied to a supported body through a cushion;

third means for system failure sensing, said third means including circuits that sense for system over-temperature or over/undervoltage conditions and command a system shut down if any such conditions are found;

an alarm generating circuit connected to said third means and producing alarm activation signals when required;

a pressure regulator circuit connected to said air pump means and to said second means;

an air pump drive circuit connected to said second means and to said pressure regulator circuit;

a servo drive circuit connected to said second means; and

a battery charging circuit for recharging said battery power supply from an external power source; and

(l) means for remotely energizing the system and announcing system alarms to a user.

6,014,785

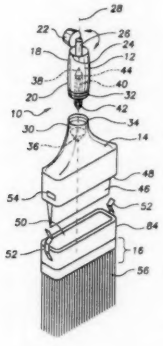
MULTI-PURPOSE TOOL

David W. Punch, and Shirley Ann Punch, both of 80067 N. Willie Rd., Folsom, La. 70437

Filed Feb. 4, 1998, Appl. No. 18,383

Int. Cl.[7] **A46B** *17/08*

U.S. Cl. 7—105 **14 Claims**



1. A multi-purpose tool, which comprises:

a paint brush having a bristle portion, a ferrule removably connected to the bristle portion, and a handle removably connected to the ferrule;

means associated with the handle for opening a can of paint;

means associated with the handle for turning a fastener; and

means associated with the ferrule for scraping a surface to be painted.

6,014,786

POCKET TOOL MAGAZINE

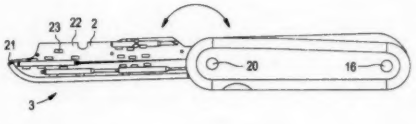
Maurice Cachot, Delémont, Switzerland, assignor to Wenger SA, Delémont, Switzerland

Filed Dec. 17, 1997, Appl. No. 991,965

Claims priority, application European Pat. Off., Jan. 17, 1997, 97810023

Int. Cl.[7] **B26B** *11/00*

U.S. Cl. 7—118 **12 Claims**



1. A tool magazine comprising:

a body including two longitudinally extending, spaced apart, parallel lateral sides to provide an interior space therebetween, said body having a pocket knife configuration for carrying in a pocket of a garment;

means securing said lateral sides to each other in a fixed relationship;

at least one extractable implement being disposed in said interior space in an inoperable position, opposing lateral faces of a longitudinally extending wall of said at least one extractable implement being essentially parallel to said lateral sides of said body;

at least one of said opposing lateral faces of said wall being provided with fixing means for removably securing a plurality of tools to said wall when said at least one extractable implement is in said inoperable position;

said fixing means permitting said plurality of tools to be removed from said at least one of said opposing lateral faces

of said wall when said at least one extractable implement is extracted from said body to an operation position; and

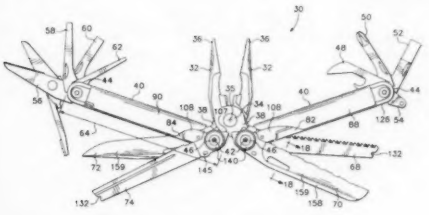
said fixing means being a plurality of fixing pins, said fixing pins having a predetermined arrangement to permit said plurality of tools to be inserted between a selected number of said plurality of fixing pins.

6,014,787

MULTIPURPOSE FOLDING TOOL WITH EASILY ACCESSIBLE OUTER BLADES

Benjamin C. Rivera, West Linn, Oreg., assignor to Leatherman Tool Group, Inc., Portland, Oreg.

Filed Oct. 30, 1997, Appl. No. 961,055
Int. Cl.[7] B25B *7/22*
U.S. Cl. 7—128 **29 Claims**



1. A folding multipurpose tool, comprising:

(a) a pair of pivotally interconnected jaws each having a base;

(b) a pair of handles, each of said handles having a first end attached pivotally to said base of a respective one of said jaws, each of said handles defining a respective central channel, and said tool having a folded configuration in which said jaws are stowed within said central channels and an open configuration in which said jaws extend away from said handles and said central channels face outwardly away from each other; and

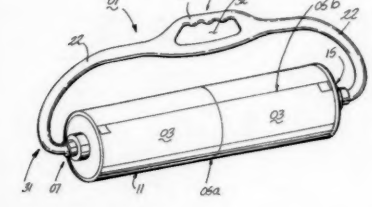
(c) each of said handles including a pair of side wing portions, each of said side wing portions defining a respective side trough that is located parallel with and alongside said respective central channel but facing in an opposite direction, and wherein each of said handles defines a respective handle-folding pivot axis, one of said handles having an outer blade mounted thereon and pivotally movable about said handle-folding pivot axis thereof, between a stowed position in a respective one of said side troughs and an extended position.

6,014,788

LINT ROLLER

Rubina Jaffri, P.O. Box 182004, Shelby, Mich. 48318, assignor to Rubina Jaffri, Shelby, Mich.

Filed Sep. 3, 1997, Appl. No. 922,658
Int. Cl.[7] A47L *13/10*
U.S. Cl. 15—104.002 **18 Claims**



1. A lint roller, comprising:

a rotatable core;

at least one sheet of material disposed on said core, said sheet having a layer of adhesive disposed on one surface such that said adhesive is outwardly facing from said core; and

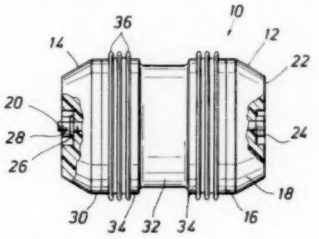
at least one non-adhesive gripping tab extending outwardly away from an edge of each of said at least one sheet so as to permit selective removal of each of said at least one sheet from said core; wherein said gripping tab extends less than the entire length of said edge of said at least one sheet.

6,014,789

MULTIPLE TUBE CLEANING PIG FEATURING REPLACEABLE DISKS ANCHORING CLEANING STUDS

Kenneth M. Knapp, 4018 W. Main, Houston, Tex. 77027

Filed Feb. 3, 1998, Appl. No. 18,000
Int. Cl.[7] B08B *9/04*
U.S. Cl. 15—104.063 **14 Claims**



1. A pig for cleaning heat exchanger tubes formed of thin wall tubes subject to coating on the inside wherein the coating over time becomes harder to the range of at least about 4 mohs, a heat exchanger tube cleaning pig comprising:

(a) front and back end pieces supported on a lengthwise mandrel, wherein said front and back end pieces each comprises cylindrical section and a conic section;

(b) a dimensionally stable interchangeable disk between the end pieces of the pig, wherein truncated ends of said conic sections of said front and back pieces face in opposite directions and away from said disk; and

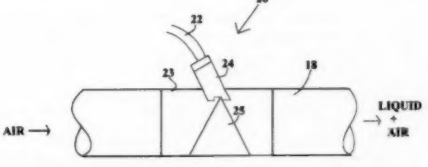
(c) a plurality of precisely positioned mounting studs on said disk wherein each of said studs has an outer end and said outer ends collectively define a concentric radial edge about the centerline axis of the pig precisely located for cleaning the deposits in the tube.

6,014,790

DUCTWORK CLEANING SYSTEM

David A. Smith, 14755 Lochinvar Dr., Dallas, Tex. 75240, and John D. Crutcher, 636 Lexington St., Dunedin, Fla. 34698

Filed Jul. 30, 1998, Appl. No. 126,510
Int. Cl.[7] A47L *5/36*
U.S. Cl. 15—304 **6 Claims**



1. A system for cleaning building ductwork comprising:

a. means for supplying a vacuum;

b. a liquid waste tank coupled to the vacuum supply means;

c. a vacuum hose running between the liquid waste tank and the building ductwork to be cleaned; and

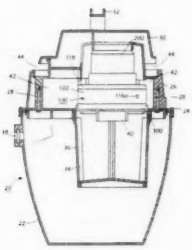
d. means for injecting a spray of liquid into said vacuum hose so as to wet any particles flowing within said vacuum hose to permit the wet particles to be trapped within said liquid waste tank.

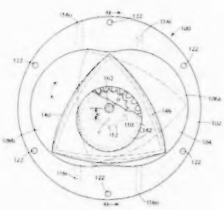
6,014,791

QUIET VACUUM CLEANER USING A VACUUM PUMP WITH A LOBED CHAMBER

Daniel M. Nosenchuck, Mercerville, N.J., assignor to SounDesign, L.L.C., Mercerville, N.J.

Filed Feb. 9, 1998, Appl. No. 21,069
Int. Cl.[7] A47L *5/12*
U.S. Cl. 15—327.1 **14 Claims**





1. A vacuum cleaner capable of generating a reduced-pressure fluid flow in which matter can be entrained for transport from one location to another, said vacuum cleaner comprising:

a compartment for collecting said entrained matter; and

a vacuum pump having a chamber with a plurality of lobes and a generally polygonal rotor with a plurality of sides greater in number than said plurality of lobes, said rotor being mounted for eccentric rotation within said lobed chamber to generate a reduced pressure in said lobes as said rotor rotates relative to said chamber, wherein said chamber is operatively connected to said compartment to induce said fluid flow therethrough.

6,014,792

BAND CLAMP INCLUDING BAND AND SEPARATELY ATTACHED BUCKLE

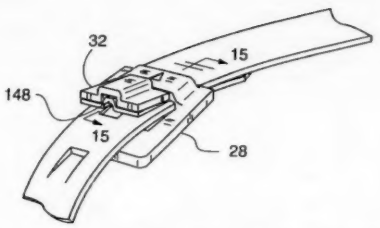
Miklos Marelin, Aurora; Mark Mossbrucker, Littleton; Hans R. Hinnen, Wheat Ridge, and John E. Whalen, Jr., Evergreen, all of Colo., assignors to Band-It-Idex, Inc., Denver, Colo.

Filed Oct. 20, 1998, Appl. No. 176,049
Int. Cl.[7] B65D *63/00;* **F16L** *33/00*
U.S. Cl. 24—20 R **21 Claims**

1. A clamping device for fastening to an object, comprising:

a band for wrapping around an object;

a buckle secured to a first end of the band, the buckle including a shroud defining a first plane and a base defining a second plane, the first and second planes intersecting at an angle and the base containing a slot located below the shroud for receiving a second end of the band, wherein at least a portion



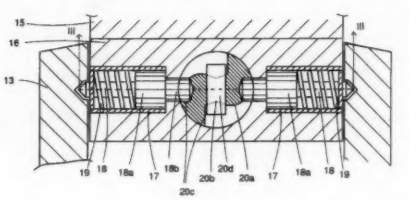
of the base crosses over a portion of the band located in the slot.

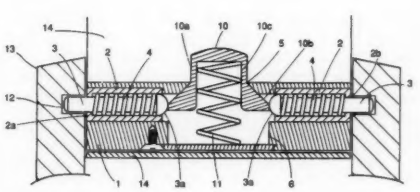
6,014,793

DEVICE FOR ATTACHING THE EXTREMITY OF A LINK TO AN OBJECT, PARTICULARLY A WATCH

Michel Howald, Chêne-Bourg, Switzerland, assignor to Mady's Time Properties LLC, Cheyenne, Wyo.

PCT No. PCT/IB96/01459, § 371 Date Jun. 25, 1998, § 102(e) Date Jun. 25, 1998, PCT Pub. No. WO97/24044, PCT Pub. Date Jul. 10, 1997
PCT Filed Dec. 23, 1996, Appl. No. 91,862
Claims priority, application France, Dec. 26, 1995, 95 15804
Int. Cl.[7] A44C *5/00*
U.S. Cl. 24—265 B **21 Claims**





1. A device for attaching the end of a strap-like member to an object, comprising a housing (**1**, **16**, **31**) provided with two latch pins (**3**, **18**, **33**) adapted to be received in facing recesses of the object, one of these pins being able to occupy two positions, a first position in which it protrudes from said housing to come to engage in one of said recesses of the object, and a second position in which it is retracted, biasing means (**4**, **19**, **32**) tending to return this pin into one of these two positions, and a movable control member (**10**, **20**, **35**) accessible from outside the housing (**1**, **16**, **31**) associated with a cam (**10***b*, **20***a*, **35***b*) for moving this pin (**3**, **18**, **33**) into the other of said positions against the action of said biasing means (**4**, **19**, **32**), characterised by the fact that the pin (**3**, **18**, **33**) able to occupy two positions is slidably mounted along a common axis of the two pins (**3**, **18**, **33**), and the movable control member (**10**, **20**, **35**) is solid with said cam (**10***b*, **20***a*, **35***b*) engaging with the inner end (**39**, **18***b*, **34**) of one of the pins (**10***b*, **20***b*, **35***b*), which inner end is applied against this cam (**10***b*, **20***b*, **35***b*) by said biasing means (**14**, **19**, **32**) such that movement of said control member (**10**, **20**, **31**) brings this pin (**3**, **18**, **33**) into the other of said positions against the pressure exerted by said biasing means (**4**, **19**, **32**).

6,014,794

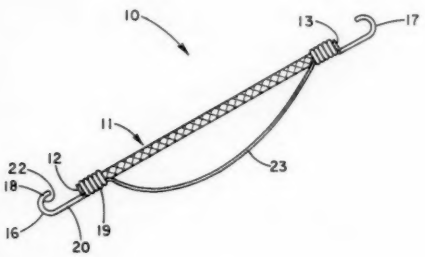
REINFORCED BUNGEE CORD TIE DOWN

Patrick M. Mc Coy, 940 Meadow Oak Dr., Monticello, Minn. 55362

Filed Mar. 25, 1999, Appl. No. 276,110

Int. Cl.[7] **A44B** *13/00;* **B65D** *63/10*

U.S. Cl. 24—300 **6 Claims**



5. A tie down, comprising:

an elongate elastic member having a pair of opposite ends;

said elastic member having a relaxed stated from which said elastic member may be stretched to a stretched state, said elastic member having a first length when in said relaxed state and a second length greater than said first length when in said stretched state;

each of said ends of said elastic member having a hook coupled thereto;

an elongate inelastic flexible member having a pair of opposite ends, and a length defined between said ends of said flexible member;

one of said ends of said flexible member being coupled to one of said ends of said elastic member and the other of said ends of said flexible member being coupled to the other of said ends of said elastic member;

said length of said flexible member being greater than said first length of said elastic member and less than said second length of said elastic member; and

wherein said elasticity of said elastic member is at least about five times that of said flexible member.

6,014,795

SLIDE ZIPPER ASSEMBLY

Michael J. McMahon, Palatine; Donald L. Van Erden, Wildwood; Robert G. Kobetsky, Chicago; Art Malin, Northbrook, all of Ill., and Zdenek Machacek, Nanuet, N.Y., assignors to Illinois Tool Works Inc., Glenview, Ill.

Continuation of application No. 09/093,111, Jun. 8, 1998. This application Jan. 12, 1999, Appl. No. 228,999.

Int. Cl.[7] **A44B** *19/00*

U.S. Cl. 24—400 **3 Claims**

1. A slide zipper assembly comprising:

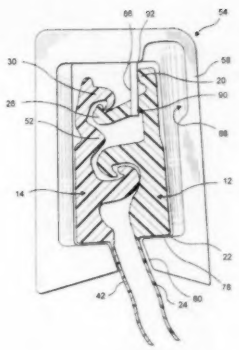
an interlocking zipper having a first profile and a second profile;

said first profile including a base having a hooked arm extending from said base toward said second profile;

said second profile including a base having a hooked arm extending from said base toward said first profile, said profile hooked arms being engaged when said zipper is in a closed position;

a slider disposed for movement along said zipper, said slider including a top portion and first and second arms depending from said top portion, said first and second arms depending from said top portion, said first and second arms respectively disposed adjacent said first and second profiles;

said first slider arm including an inwardly directed tab having a tapered surface disposed to engage a portion of said first profile and vertically shift said first profile hooked arm out of engagement with said second profile hooked arm as said slider is moved along said zipper in an opening direction.



6,014,796

SEAT BELT BUCKLE

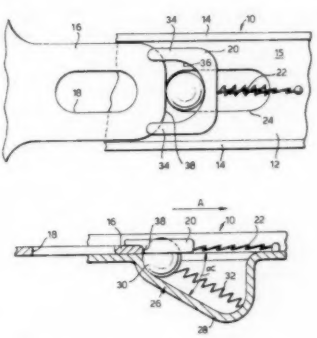
Mark John Harrison, Belfast, and Michael John Jackson, Cullybackey, both of United Kingdom, assignors to European Components Co. Limited, Dundonald, United Kingdom

Filed Jun. 3, 1998, Appl. No. 89,542

Claims priority, application United Kingdom, Jun. 6, 1997, 9711827

Int. Cl.[7] **A44B** *11/00*

U.S. Cl. 24—633 **5 Claims**

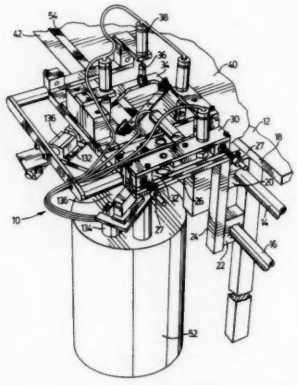


1. A seat belt buckle comprising a frame, a tongue adapted to be carried by the seat belt and slidably insertable into the frame along a planar path in an insertion direction, an aperture provided in said tongue, an ejector slidable in said frame along said path and engagable by said tongue when inserted in said frame, an ejector spring urging said ejector in a direction to push said tongue in the reverse direction along said path, a track inclined at an acute angle to said planar path and extending at said acute angle outwardly away from said planar path in said insertion direction, a retainer movable along said track and lockingly engagable in the aperture in the tongue at a location where the track intersects the path, a retainer spring positioned effective to urge said retainer along the track towards the path, and a release mechanism adapted to disengage the retainer from the aperture, thereby to release the tongue.

6,014,797
METHOD AND APPARATUS FOR UNRAVELLING THREADS

Stephan Kuster, and Heinz Kuster, both of Sandpoint, Id., assignors to JWI Ltd., Kanata, Canada

Filed Jun. 16, 1997, Appl. No. 876,470
Int. Cl.[7] D06H *5/00*
U.S. Cl. 28—146 **14 Claims**



1. An apparatus for unravelling weft threads to form a fringe in a woven fabric web having a lateral edge substantially parallel to said weft threads, comprising:

fabric holding means supporting a portion of said fabric web;

an unravelling assembly including an unravelling needle, first reciprocation means for reciprocally driving said needle substantially perpendicular to said web wherein, in a first direction, said needle pierces said fabric, and, in a second direction, said needle captures and unravels at least one weft thread from said fabric, a cutter adjacent said needle for cutting said at least one unravelled weft thread, and second reciprocation means for selectively driving said cutter to cut said at least one weft thread;

longitudinal displacement means for moving said unravelling assembly, in incremental steps, a preselected distance toward said weft threads, and returning said unravelling assembly to a starting position detected by a sensing means; and

lateral displacement means for moving said apparatus a preselected distance along said edge.

6,014,798
METHOD AND DEVICE FOR MANUFACTURING LEAD PLATES FOR LEAD/ACID BATTERIES

Werner Nitsche, Lippstadt, and Norbert Lahme, Brilon, both of Germany, assignors to Accumulatorenwerke Hoppecke Carol Zoellner, and Sohn GmbH & Co. KG, both of Germany

Filed Jan. 5, 1998, Appl. No. 3,053
Int. Cl.[7] H01M *4/20;4/21*
U.S. Cl. 29—2 **15 Claims**

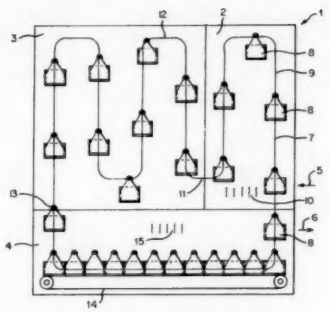
4. A method for manufacturing lead plates for a lead/acid battery, said method comprising the steps of:

A) providing lead electrode grates;

B) filling an active paste into the lead electrode grates to form filled lead plates;

C) sequentially subjecting both lateral surfaces of the filled lead plates to a continuous processing sequence of less than 6 hours under preselected processing parameters for time, temperature, humidity, and air movement, wherein the processing sequence comprises:

C1) a curing step in which moisture is added to reach a first humidity value;



C2) a pre-drying step for reducing the amount of free lead in the active paste at a second humidity value that is lower than the first humidity value of step C1),

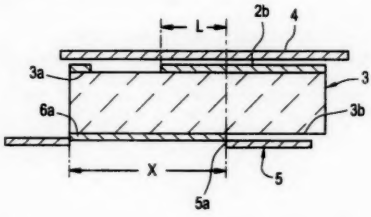
C3) a final drying step;

wherein step C1) includes introducing saturated steam at a bottom of a curing chamber in which step C1) takes place and wherein the first humidity value is about 100%.

6,014,799
METHOD OF MANUFACTURING A PIEZOELECTRIC RESONATOR

Hiroaki Kaida, Moriyama, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 8, 1999, Appl. No. 264,096
Claims priority, application Japan, Mar. 10, 1998, 10-058454
Int. Cl.[7] H01L *41/22*
U.S. Cl. 29—25.35 **18 Claims**



1. A method of manufacturing a piezoelectric resonator including a piezoelectric body, a plurality of first and second excitation electrodes overlapping each other with the piezoelectric body disposed therebetween so as to define an excitation portion, a first lead electrode extending from the corresponding first excitation electrodes to an edge portion of the piezoelectric body and connected to a first electric potential, and a second lead electrode extending to a direction opposite from the direction which said first lead electrode is extended and connected to a second electric potential, the method comprising the steps of:

providing a first mother substrate having a plurality of first strip electrodes arranged with gaps therebetween along a first direction on the first mother substrate, the first strip electrodes each extending along a second direction, the first direction extending along a direction of a line which extends between the excitation electrodes and lead electrodes and the second direction is substantially perpendicular to the first direction;

obtaining a second mother substrate by cutting said first mother substrate along said second direction such that a length of the first strip electrodes in said first direction is set according to a target resonance frequency;

using a mask to form a plurality of second strip electrodes on a major surface of the second mother substrate, each of said second strip electrodes constituting said second excitation

electrode and said second lead electrode connected to said second electric potential along said second direction; and

obtaining a plurality of piezoelectric resonators by cutting the second mother substrate along said first direction.

6,014,800

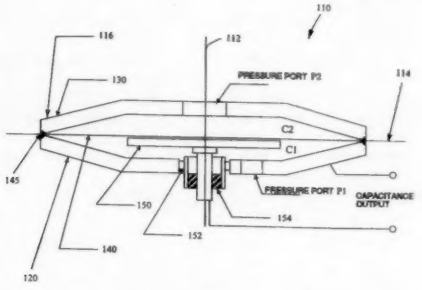
METHOD OF MAKING A PRESSURE TRANSDUCER HAVING A TENSIONED DIAPHRAGM

Shih-Ying Lee, Lincoln, Mass., assignor to Setra Systems, Inc., Boxboro, Mass.

Division of application No. 08/982,708, Dec. 2, 1997. This application Jan. 26, 1999, Appl. No. 237,377.

Int. Cl.[7] H01G *7/00*

U.S. Cl. 29—25.41 **4 Claims**



1. A method of making a capacitive pressure transducer having a tensioned diaphragm comprising the steps of:

A) providing a first concave body member extending about a central axis, and having a peripheral rim disposed in a first plane, said first plane being substantially perpendicular to said central axis, said first concave body member including at least a yieldable portion adapted for radially expanding said peripheral rim of said first concave body member with respect to said central axis in response to force applied to said first concave body member;

B) providing a diaphragm having an electrically conductive portion;

C) providing an electrode fixedly coupled to said first concave body member and having a substantially planar portion opposite to and spaced apart from said first plane;

D) fixedly coupling a peripheral portion of said diaphragm to said peripheral rim of said first concave body member whereby said diaphragm is substantially without tension and positioned substantially in said first plane; and

E) applying forces to said first concave body member whereby said concave body member is strained beyond an elastic limit of said concave body member and said peripheral rim becomes expanded whereby said diaphragm becomes tensioned.

6,014,801

SWAGE FASTENING TOOL

Robert B. Wilcox, Woodstock, N.Y., assignor to Huck International, Kingston, N.Y.

Filed Apr. 29, 1998, Appl. No. 69,105

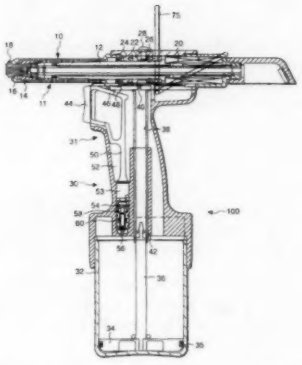
Int. Cl.[7] B21J *15/10*

U.S. Cl. 29—243.525 **22 Claims**

1. A swage fastening tool for setting a fastener including a pin and a collar, said swage fastening tool comprising:

(A) a piston-cylinder assembly comprising:

(i) a housing structure having a housing chamber positioned intermediate forward and aft ends of said housing structure extending along an axial direction, a forwardly opening



cylindrical cavity coaxially aligned with the housing chamber, and a passage extending radially through said housing structure;

(ii) a swaging assembly disposed in said forwardly opening cylindrical cavity, said swaging assembly including a jaw assembly constructed and arranged to grip and pull a pull portion of the pin and further including a swage anvil having a swage cavity constructed and arranged to engage and swage the collar radially inwardly onto the pin in response to a relative axial pull force between said jaw assembly and said swage anvil;

(iii) a reciprocally movable piston supported in said housing chamber to be slidable along the axial direction between a forward home position and a rearward position, said piston being operatively connected to said swaging assembly so that slidable movement of said piston towards the rearward position applies the relative axial pull force between said jaw assembly and said swage anvil;

(iv) a biasing member to urge said piston from the rearward position towards the forward home position;

(v) a damper assembly having a damper chamber disposed in said housing chamber, said damper chamber being in communication with said passage and containing hydraulic fluid; and

(vi) a slidable damper valve accommodated in said damper chamber and movable between a passage open position in which said passage is substantially unobstructed by said damper valve and a passage close position in which said passage is substantially covered by said damper valve to substantially restrict the flow of the hydraulic fluid through said passage; and

(B) an actuator assembly comprising:

(i) a trigger housing;

(ii) a pressure-control-mechanism-receiving housing having a hydraulic fluid-containing chamber filled with the hydraulic fluid and in communication with said damper chamber via said passage;

(iii) a trigger structure partially accommodated in said trigger housing; and

(iv) a pressure-control mechanism operatively connected to said trigger structure and movable relative to said pressure-control-mechanism-receiving housing,

wherein said trigger structure is operatively associated with said pressure-control mechanism so that (a) actuation of said trigger structure moves said pressure-control mechanism to pressurize the hydraulic fluid in said hydraulic fluid-containing chamber and thereby pass the hydraulic fluid through said passage and into said damper chamber so that the hydraulic fluid slides said piston rearward from the forward home position to the rearward position against an urging force of said biasing member and so that the hydraulic fluid slides said damper valve from the passage open position to the passage closed position, and (b) de-actuation of said trigger structure moves said pressure-control mechanism to depressurize the hydraulic fluid in said hydraulic fluid-containing chamber and

permit the urging force of said biasing member to return said piston from the rearward position to the forward home position, returning movement of said piston toward the forward home position being initially regulated by return movement of said damper valve from the passage closed position to the passage open position.

6,014,802

SHOCK-OPERATED RIVETING APPARATUS AND METHOD FOR OPERATING THIS DEVICE

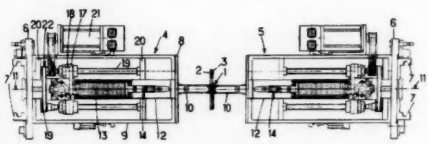
Sylvain Guerin, Seclin, France, assignor to Dassault-Aviation, Paris, France

Filed Oct. 9, 1996, Appl. No. 728,059

Claims priority, application France, Oct. 11, 1995, 95 11935

Int. Cl.[7] B23Q *17/00;* **B21J** *15/26*

U.S. Cl. 29—407.01 **9 Claims**



1. An apparatus for joining workpieces by riveting, said apparatus comprising a first tool and a second tool for acting in a substantially synchronous manner on opposite ends of a rivet, said first and second tools respectively comprising:

first and second carrier devices;

a first riveting-set assembly including a first riveting set and a second riveting-set assembly including a second riveting set, said first and second riveting-set assemblies being respectively mounted on said first and second carrier devices;

first and second guiding means for respectively moving each of said first and second riveting-set assemblies along a defined path;

means for keeping each of said first and second carrier devices in a position respectively to move an active face of one of said first and second riveting sets substantially along a path parallel to an axis of said rivet, when said active face comes into contact with a corresponding end of the rivet;

driving means for driving each of said first and second carrier devices, said driving means comprising first and second electric motors for respectively imparting a velocity to a corresponding one of said first and second riveting sets moving along its said path toward the other one of said first and second riveting sets, said velocity being sufficient to provide the riveting set with sufficient kinetic energy to form the rivet; and

control means for actuating said driving means to drive said first and second carrier devices approximately simultaneously.

6,014,803

THERMAL TRIGGERING SYSTEM

Rainer Lewin, Berlin, Germany, assignor to Siemens AG, Munich, Germany

PCT No. PCT/DE96/02356, § 371 Date Jun. 17, 1998, § 102(e) Date Jun. 17, 1998, PCT Pub. No. WO97/23887, PCT Pub. Date Jul. 3, 1997

PCT Filed Dec. 9, 1996, Appl. No. 91,445

Claims priority, application Germany, Dec. 22, 1995, 195 48 479

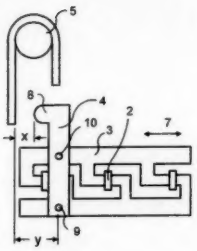
Int. Cl.[7] H01H *69/02*

U.S. Cl. 29—623 **1 Claim**

1. A method for producing a thermal triggering system for an electric switchgear, comprising the steps of:

providing a bimetal element;

providing a slide having a receptacle, the receptacle receiving the bimetal element;



providing a switching element for triggering a switching element, the switching element being provided in the electric switchgear;

measuring a position of the switching element in the electric switchgear;

fastening a differential element to the slide via first and second bearing points, the slide shortening a distance between the differential element and the switching element by moving the slide in a first direction, the first bearing point being a center of rotation of the differential element on the slide, and the second bearing point being determined as a function of the measured position; and

mounting the slide in the electric switchgear.

6,014,804

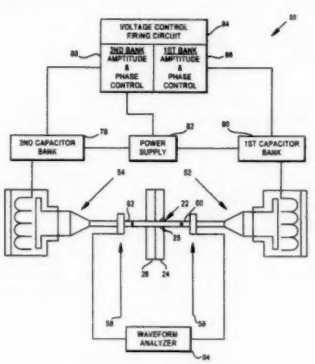
LOW VOLTAGE ELECTROMAGNETIC PROCESS AND APPARATUS FOR CONTROLLED RIVETING

Kenneth E. Lulay, Seattle, and Paul G. Kostenick, Everett, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 12, 1998, Appl. No. 96,884

Int. Cl.[7] B23P *21/00*

U.S. Cl. 29—715 **4 Claims**



1. A low-voltage electromagnetic riveter for controlling the force over time applied to a head and a tail of a rivet within an assembly having a workpiece that is countersunk to receive the head of the rivet, said riveter comprising:

a head and a tail actuator that respectively apply a force over time to the head and the tail of the rivet, each of said actuators including:

a die which contacts the rivet;

a coil which creates a repulsive force when electrical current is passed therethrough;

a driver physically adjacent to said coil and movable along an axis of the rivet by the repulsive force created by said coil; and

a load cell positioned between said driver and said die to measure the force over time applied to a designated end of the rivet said load cell including:

an annular shaped piezo-electric device;

a washer and a strip of tape positioned on either end of said piezo-electric device between said device and said driver and said device and said die to suppress undesirable noise to said piezo-electric device; and

a stud passing through said piezo-electric device and physically coupling said die to said driver, such that said piezo-electric device is snugly positioned therebetween; and

a head current source and a tail current source electrically connected to said coil of said respective head and tail actuator for supplying a controlled amount of current; and

a firing circuit electrically connected to each of said head current source and said tail current source for controlling phase and magnitude of the controlled amount of current supplied to each of said head actuator and said tail actuator.

6,014,805

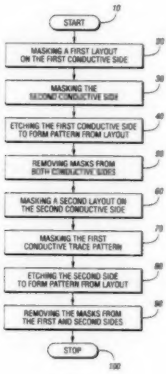
METHOD OF FABRICATING A HYBRID PRINTED CIRCUIT BOARD

Joan Maria Buixadera Ferrer, Valls, Spain, assignor to Lear Automotive Dearborn, Inc., Southfield, Mich.

Filed Oct. 29, 1997, Appl. No. 960,473

Int. Cl.[7] H01K *3/10*

U.S. Cl. 29—852 **14 Claims**



1. A method of fabricating a hybrid printed circuit board on a dielectric substrate, the method comprising the steps of:

masking a first pattern on a first side of the dielectric substrate;

masking a second side of the dielectric layer;

etching said first side of the dielectric layer to form a first conductive pattern while maintaining the integrity of said second side of the dielectric layer;

removing the mask from said second side of the dielectric layer and from said first conductive pattern;

then 1) masking a second pattern on said second side of the dielectric substrate;

2) masking said first side of the dielectric layer;

then 3) etching said second side of the dielectric layer to form a second conductive pattern while maintaining the integrity of said first side of the dielectric layer; and

removing the mask from first side of the dielectric layer and from said second conductive pattern.

6,014,806

ADJUSTABLE HINGE MOUNT FOR RECLINABLE SEAT

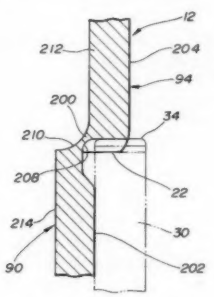
Masakiyo Ohya, Kosai, Japan, assignor to Fuji Kiko Co., Ltd., Tokyo, Japan

Division of application No. 08/668,810, Jun. 24, 1996, Pat. No. 5,813,724. This application Nov. 4, 1997, Appl. No. 964,400.

Claims priority, application Japan, Jun. 23, 1995, 7-157437; Jun. 30, 1995, 7-165819; Jun. 30, 1995, 7-165820; Jun. 30, 1995, 7-165821; Jul. 6, 1995, 7-170079; Nov. 30, 1995, 7-312206; Dec. 26, 1995, 7-338345; Jan. 30, 1996, 8-13464; Mar. 28, 1996, 8-73024

Int. Cl.[7] B21D *53/28*

U.S. Cl. 29—893.33 **2 Claims**



1. A method of manufacturing an impression with internal teeth in a flat wall of a hinge member of an adjustable hinge mount, comprising the steps of:

providing a hinge member of an adjustable hinge mount;

stamping said hinge member, thereby forming said hinge member into an intermediate member having a major portion with a first planar bottom surface and a parallel first planar upper surface, a recessed portion with a second planar bottom surface and a parallel second planar upper surface that is generally parallel to and offset from the first planar upper surface, and a continuous peripheral wall interconnecting the first planar upper surface with the second planar upper surface; and then

simultaneously stamping and cold pressing said intermediate member, thereby forming a plurality of teeth in said continuous peripheral wall, and a bridge portion that interconnects said major portion with said recessed portion, wherein the bridge portion includes:

(i) a concave outer wall interconnecting said first planar bottom surface with said second planar bottom surface, wherein the concave outer wall faces in a first direction; and

(ii) a concave inner wall interconnecting said second planar upper surface with said continuous peripheral wall, wherein a portion of the concave inner wall is located between said teeth and said second planar upper surface, and wherein the concave inner wall faces in a second direction that is substantially opposite to said first direction.

6,014,807

METHOD OF MANUFACTURING A DOUBLE-STRUCTURE SYNCHRONIZER RING

Jung Sok O, Seoul, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

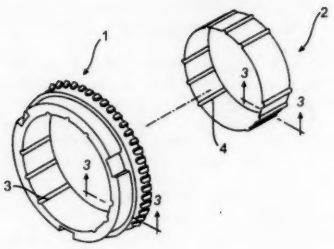
Filed Jun. 18, 1997, Appl. No. 878,099

Claims priority, application Rep. of Korea, Jun. 18, 1996, 96-26765

Int. Cl.[7] B21D *53/28*

U.S. Cl. 29—893.37 **11 Claims**

1. A process for manufacturing a double-structure synchronizer ring in an integrated form and assembled for use in an automobile gear, comprising:



preparing an external ring body portion by press-molding and sintering an iron-based sintering metal material powder;

preparing an inter-diameter indentation portion by spraying a copper powder on a cold-indented steel sheet and press-molding and sintering the cold-indented steel sheet; and then

inserting the inter-diameter indentation portion into the inter-diameter of the external ring body portion.

6,014,808

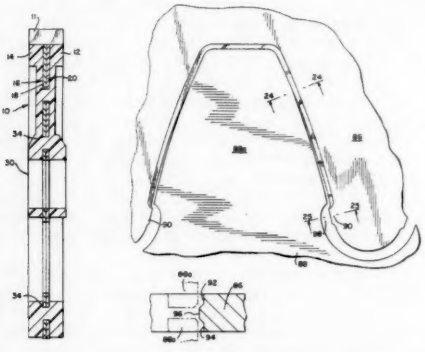
METHOD OF MAKING A COMPOSITE GEAR

John D. Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Division of application No. 08/941,217, Oct. 1, 1997, Pat. No. 5,852,951, which is a continuation of application No. 08/635,298, Apr. 19, 1996, abandoned, which is a continuation-in-part of application No. 08/317,323, Oct. 4, 1994, abandoned. This application Jul. 13, 1998, Appl. No. 114,388.

Int. Cl.[7] **H01B** *19/00*

U.S. Cl. 29—893.37 **8 Claims**



1. A method of manufacturing a composite gear, said gear having a plurality of gear teeth, comprising:

providing a tool having a cavity partially defined by a surface, said surface having a plurality of tool teeth defined therein, at least some of said tool teeth having a central section and two side sections on opposite sides of said central section, said central section being larger than said side sections in a circumferential direction;

providing a rigid body having rigid gear teeth portions on a periphery thereof, said gear teeth portions having first and second opposed sides;

disposing said rigid body in said cavity;

causing a thermoplastic material to flow on said first side of said rigid body adjacent to said first side section of said tool teeth such that substantially no thermoplastic material flows in any spaces between said rigid gear teeth portions and said central sections of said tool teeth; and

causing a thermoplastic material to flow on said second side of said rigid body adjacent to said second side section of said tool teeth such that substantially no thermoplastic material flows in any spaces between said rigid gear teeth portions and said central sections of said tool teeth.

6,014,809

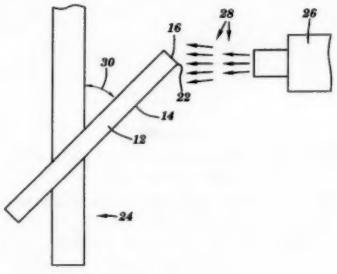
METHOD FOR CIRCUITIZING OVER AN EDGE OF A CIRCUIT CARD

Robert D. Sebesta, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1998, Appl. No. 33,618

Int. Cl.[7] **H05K** *3/02*

U.S. Cl. 29—896 **21 Claims**



1. A method of circuitizing over an edge of a substrate such that both a first and a second surface of said substrate are uniformly circuitized, said method comprising the steps of:

angling said substrate such that said first surface, said second surface, and said edge form an exposed region;

metallically sputter seeding said exposed region from a source to form a metallic sputter seed layer;

covering said exposed region with a dielectric material to provide a protective layer;

creating a plating mask on said exposed region by ablating said dielectric in a predetermined pattern;

applying a conductive layer to said predetermined pattern to form a circuitized pattern;

removing any unablated dielectric material thereby exposing portions of said metallic sputter seed layer; and

removing and said exposed metallic sputter seed layer to form a circuitized member.

6,014,810

PORTABLE TUBING CUTTER

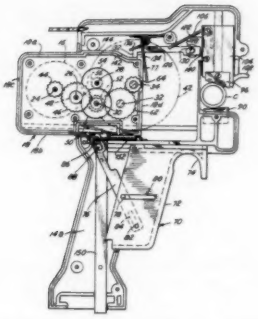
Kent L. Earle, Woodridge, and Greg L. Lauriano, Plainfield, both of Ill., assignors to Etcon Corporation, Burr Ridge, Ill.

Filed Mar. 25, 1994, Appl. No. 218,507

Int. Cl.[7] **B23D** *21/06*

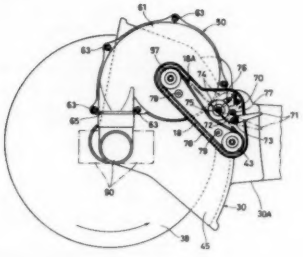
U.S. Cl. 30—92 **12 Claims**

1. A portable cutter for cutting conduit comprising, in combination, a housing, a carriage slidably mounted on said housing for sliding movement relative thereto, a saw blade rotatably supported on said carriage, a motor mounted on said carriage and operatively connected to said saw blade for rotating said saw blade, a battery supported by said housing and connected to said motor for supplying power to said motor, gripping members carried on said housing and movable between an open position and a closed position for firmly gripping an object to be cut, means for actuating said gripping members to closed position where they firmly grip said object to be cut, and a manually operable actuator carried by said housing and operatively connected with said carriage for moving said carriage from a retracted inoperative position to an advanced



operative position where said saw blade is moved into cutting engagement with an object held by said gripping members.

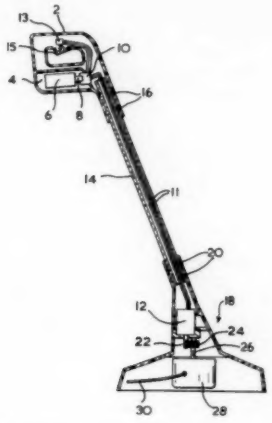
6,014,811
POWER CUTTER
Toshio Taomo, and Wang Yan Song, both of Tokyo, Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Feb. 13, 1998, Appl. No. 23,798
Claims priority, application Japan, Feb. 14, 1997, 9-030794
Int. Cl.[7] B23D *45/16*
U.S. Cl. 30—124 **1 Claim**



1. A power cutter, comprising:
a frame;
a prime mover mounted on said frame;
an operative cutting component having cutting means being driven by the prime mover;
a dust suction-discharge fan, having a dust discharge port, for discharging, by sucking, dust resulting from cutting operations by said cutting means;
a belt-type driving mechanism having a drive belt for coupling said prime mover to said dust suction-discharge fan; and
a belt tension clutch for selectively tensioning or untensioning said drive belt to selectively connect and disconnect said prime mover from said dust discharge fan.

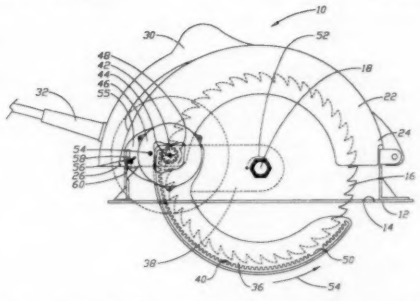
6,014,812
BATTERY POWERED VEGETATION TRIMMER
Craig Webster, Newcastle-upon-Tyne, United Kingdom, assignor to Black & Decker, Inc., Newark, Del.
Filed Nov. 6, 1997, Appl. No. 965,122
Claims priority, application United Kingdom, Nov. 8, 1996, 9623309; Jun. 5, 1997, 9711511
Int. Cl.[7] A01D *50/00*
U.S. Cl. 30—276 **41 Claims**

1. A hand held battery powered vegetation trimmer substantially supported in use above ground in a cutting position, the trimmer comprising:



an electric motor;
a battery pack that powers the electric motor to generate a rotary output;
a cutting line adapted to be rotatably driven by a line support structure; and
a reduction gear stage through which the rotary output drives the line support structure, wherein
the reduction gear stage has a reduction ratio between about 2:1 and 4:1,
the line support structure has a rotation speed of between about 5,000–9,000 rpm when there is no cutting load on the trimmer, and
a rotation speed of the motor is between about 13,000–28,000 rpm when there is no cutting load on the trimmer.

6,014,813
POWER HAND SAW WITH POWERED BLADE GUARD ASSEMBLY
Frank J. Merino, 1468 Wood St., Crete, Ill. 60417
Filed Oct. 17, 1997, Appl. No. 953,141
Int. Cl.[7] B27G *19/04;* **B23D** *45/16;* **B27B** *9/00*
U.S. Cl. 30—391 **20 Claims**



1. In a power hand saw having a housing assembly, a blade movably mounted to the housing assembly and a blade drive power source mounted to the housing assembly and mechanically linked to the blade to selectively provide drive power to the blade in response to a blade drive power source actuator, an elongate blade guard and means for mounting the blade guard to the housing assembly for movement between a guarding position in which a selected portion of the blade is protectively covered by the elongate blade guard and a nonguarding position in which the selected portion of the blade is not protectively covered, the improvement being a power blade guard assembly, comprising:

a set of gear teeth fixedly attached to and extending along the elongate blade guard;

a source of blade guard drive power; and

means for selectively applying drive power through the source of blade guard drive power to the set of gear teeth to selectively move the blade guard from the guarding position to the nonguarding position and move the blade guard from the nonguarding position to the guarding position.

6,014,814

METHOD AND TOOL FOR DETERMINING ON A VEHICLE, ESPECIALLY AN AIRCRAFT, THE HARMONIZATION ERROR OF AN EQUIPMENT ITEM

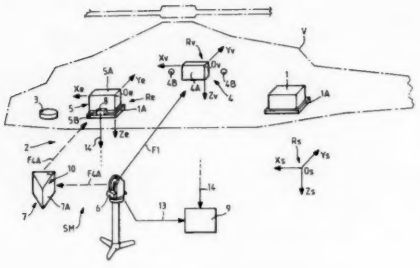
Daniel Henri Adrien Imbert, Marseilles, and Jean-Louis Cessi, Marignane, both of France, assignors to Eurocopter, Cedex, France

Filed Nov. 13, 1997, Appl. No. 968,608

Claims priority, application France, Nov. 14, 1996, 96 13865

Int. Cl.[7] **G01C** *25/00;15/00*

U.S. Cl. 33—228 **6 Claims**



1. A method for determining on a vehicle (V), especially an aircraft, the harmonization error between an item of on board equipment (**1**) and a system of reference axes of said vehicle (V) forming a vehicle reference frame (Rv), which method has the following steps:

a) a first reference element (**4**) that represents said vehicle reference frame (Rv) and is optically accessible from the outside is placed on board said vehicle (V) sitting on the ground;

b) a second reference element (**5**) that represents said item of equipment (**1**) and is optically accessible from the outside is placed on board said vehicle (V) at the site of said item of equipment (**1**); and

c) using a theodolite-type measurement system (SM) arranged at least partially outside the vehicle (V) and taking measurements of said first and second reference elements (**4**, **5**), the harmonization error of said second reference element (**5**) that represents the item of equipment (**1**) with respect to said first reference element (**4**) which represents the vehicle reference frame (Rv) is determined,

wherein, in step c):

the harmonization error in terms of yaw and in terms of roll is determined using measurements made by a single theodolite (**6**) placed on the ground in such a way that it can take measurements by being capable of sighting both said first reference element (**4**) and said second reference element (**5**), one of said sightings being made directly while the other sighting is made through a prism system (**7**); and

the harmonization error in terms of pitch is determined using measurements made on said first and second reference elements (**4**, **5**) by the theodolite (**6**) and by an inclination meter (**8**) respectively.

6,014,815

MACHINE FOR PRODUCING A DESIGN TRACK POSITION

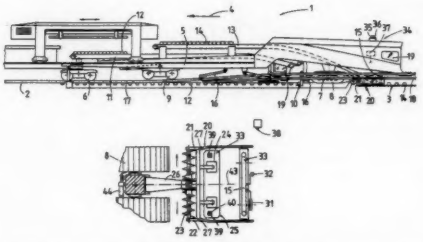
Heinz Jäger, Volketswil, Switzerland, assignor to J. Muller AG, Switzerland

Filed May 9, 1997, Appl. No. 854,139

Claims priority, application European Pat. Off., May 9, 1996, 96107340

Int. Cl.[7] **E01B** *35/04*

U.S. Cl. 33—287 **7 Claims**



1. A railroad track machine comprising a machine frame, chassis means supporting said frame for movement relative to a rail bed, a working unit supported by said frame and being movable towards and away from the upper surface of the ballast of the rail bed and also being movable laterally of the rail bed, an adjusting drive supported by said frame and operatively connected to said working unit for adjusting the position of the working unit, first laser means supported by said frame and being adapted to detect the position of a geodetically placed marker relative to the machine frame, second laser means supported by said frame for detecting the position of the working unit relative to the machine frame, and a control device connected to each of said laser means and to said adjusting drive for controlling the operation of said adjusting drive and thereby adjusting the position of said working unit.

6,014,816

COORDINATE MEASURING APPARATUS WITH A BALL PROBE

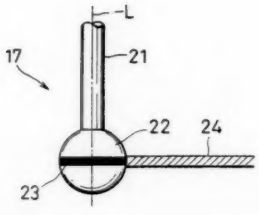
Sadayuki Matsumiya, and Shigeo Miyamoto, both of Kanagawa, Japan, assignors to Mitutoyo Corporation, Kanagawa, Japan

Filed Aug. 13, 1997, Appl. No. 910,708

Claims priority, application Japan, Aug. 19, 1996, 8-235940

Int. Cl.[7] **G01B** *5/016*

U.S. Cl. 33—503 **8 Claims**



1. A ball probe outputting a touch signal at the moment of coming into contact with an object to be measured, comprising:

a shaft supported with a movable support member, and

a ball attached to the extremity of said shaft to be brought into contact with said object to be measured,

wherein a mark is positioned on the surface of said ball in order to identify a crossing line between a plane passing the center of said ball and orthogonally crossing the central axis of said shaft and the surface of said ball.

6,014,817

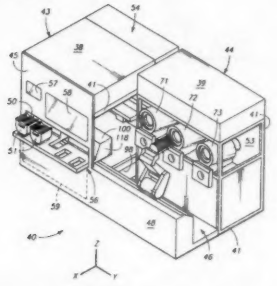
SEMICONDUCTOR WAFER PROCESSING SYSTEM

Raymon F. Thompson, Lakeside; Robert W. Berner, Kalispell; Gary L. Curtis, Kila; Stephen P. Culliton, Kalispell, and Blaine G. Wright, Whitefish, all of Mo., assignors to Semitool, Inc., Kalispell, Mo.

Division of application No. 08/813,860, Mar. 7, 1997, Pat. No. 5,043,386, which is a continuation of application No. 08/623,659, Mar. 29, 1996, Pat. No. 5,788,454, which is a continuation of application No. 08/236,424, Apr. 28, 1994, Pat. No. 5,544,421. This application Jan. 13, 1999, Appl. No. 229,542.

Int. Cl.[7] F26B *17/24*

U.S. Cl. 34—60 **15 Claims**



15. A method for processing semiconductor wafers or similar articles comprising the steps of:

opening an enclosure door to provide access into the enclosure;

loading a wafer carrier containing a batch of wafers into enclosure by moving through the enclosure doorway;

closing the enclosure door, to provide a substantially enclosed working space within the enclosure;

lifting the batch of wafers out of the wafer carrier;

placing the batch of wafers into a carriage;

conveying the batch of wafers from the carriage into a processing station; and

processing the batch wafers.

6,014,818

DRYING APPARATUS HAVING A FRAME DEVICE FOR MOUNTING JET BOXES

Sture Kriström, Babordsv 19, S-865 31 Alnö, Sweden

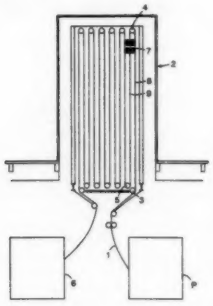
PCT No. PCT/SE96/00057, § 371 Date Sep. 15, 1997, § 102(e) Date Sep. 15, 1997, PCT Pub. No. WO96/22419, PCT Pub. Date Jul. 25, 1996

PCT Filed Jan. 22, 1996, Appl. No. 875,116

Claims priority, application Sweden, Jan. 20, 1995, 9500196

Int. Cl.[7] F26B *23/10*

U.S. Cl. 34—273 **6 Claims**



1. Apparatus for drying a pulp web, comprising:

a frame;

upper (**4**; **20**) turning devices, positioned in the frame in an upper part of the apparatus;

lower (**5**; **11**) turning devices, positioned in the frame in a lower part of the apparatus, wherein the upper and lower turning devices lead the pulp web (**8**; **9**) upwards and downwards; and

a plurality of jet boxes (**7**; **21**) arranged in essentially vertical piles, and positioned such that the pulp web can pass between the piles of jet boxes; wherein each of the jet boxes defines a primary opening for introducing heated air into the jet boxes and a plurality of secondary openings in a side of the jet boxes for directing the heated air out of the jet boxes for drying the pulp web, the jet boxes being arranged so that both sides of the pulp web are irradiated with the heated air, the side of the jet boxes having the plurality of secondary openings being essentially flat, the jet boxes (**7**; **21**) essentially occupying all of a space in a vertical direction between the upper (**4**:**20**) and the lower (**5**:**11**) turning devices;

wherein the jet boxes (**7**:**21**) are suspended in the frame in the upper part of the apparatus, and hang freely down from the upper part towards the lower part of the apparatus, whereby the jet boxes can expand in downward direction.

6,014,819

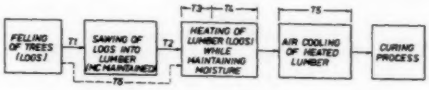
PROCESS FOR TREATING GREEN WOOD

Danny J. Elder, Rte. 5, 110B, Kirbyville, Tex. 75956

Continuation-in-part of application No. 08/859,848, May 21, 1997, and application No. 08/886,497, Jul. 1, 1997, Pat. No. 5,836,086. This application Oct. 23, 1998, Appl. No. 178,524.

Int. Cl.[7] F26B *7/00*

U.S. Cl. 34—396 **21 Claims**



7. A green wood treating process for treating green wood prior to curing for minimizing staining of the green wood, the green wood arranged in bundles of lumber with boards spaced from each other; said green wood treating process comprising the following steps:

positioning said bundles of green wood within a heating enclosure for heating;

heating said green wood with steam within said heating enclosure sufficient to provide a generally uniform heating of the green wood to a predetermined temperature over about 120 F. for a predetermined time period sufficient to provide a generally uniform heating of the green wood while substantially maintaining the moisture content of said green wood during heating;

applying cooling air at a temperature at least 30 F. lower than the temperature of the heated wood to the heated green wood for substantially surrounding the separate boards of the green wood after heating of said green wood to a predetermined temperature for a predetermined time; and

maintaining the application of the cooled air to the wood for a predetermined time period.

6,014,820

SHUTTLE VALVE FOR TWIN TOWER AIR DRYER

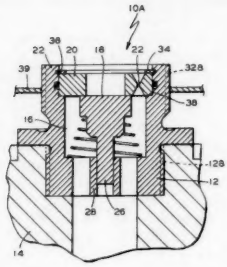
Charlie E. Jones, Greenville; Michael V. Kazakis, Simpsonville, and Murtaza R. Dossaji, Spartanburg, all of S.C., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 2, 1998, Appl. No. 17,126

Int. Cl.[7] F26B *19/00*

U.S. Cl. 34—548 **9 Claims**

1. A shuttle valve for a twin tower gas drying system having two drying assemblies for cleaning and drying a stream of unpurified pressurized air received from a source thereof and for supplying purified air to a pneumatic system with a purge percentage of such purified air for purging alternately from each such drying assembly



moisture previously retained via remoisturization of such purified air, said shuttle valve comprising:

a housing connecting one of such drying assemblies to such source of such unpurified pressurized air,

a choke disc located within said housing and having an orifice,

a movable piston located in axial alignment with said choke disc,

such that when such unpurified pressurized air is directed into such one of such drying assemblies for drying such unpurified pressurized air, the piston moves away from said choke disc to permit relatively dry air to freely flow from such one drying assembly and through said shuttle valve to such pneumatic system with a portion of such dry air being directed to a second shuttle valve and second drying assembly for removing moisture from such second drying assembly.

6,014,821

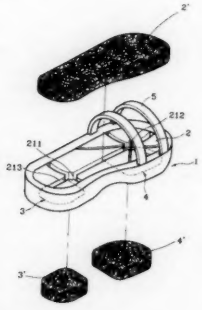
SEASHORE SANDAL

Larry Yaw, Taichung, Taiwan, assignor to Union Looper Co., Ltd., Taichung, Taiwan

Filed Dec. 16, 1998, Appl. No. 212,401

Int. Cl.[7] A43B *5/08;3/12;7/08*

U.S. Cl. 36—8.1 **4 Claims**



1. A seashore sandal comprising:

a sandal body, said sandal body comprising a recessed top chamber defined within a top side wall thereof, a first recessed bottom chamber and a second recessed bottom chamber defined within a bottom side wall thereof, a first drain hole in communication between said recessed top chamber and said first recessed bottom chamber, a second drain hole in communication between said recessed top chamber and said second recessed bottom chamber, and a plurality of grooves at the top side wall in communication with said drain holes;

a plurality of straps respectively mounted on said sandal body and adapted to secure said sandal body to the user's foot; and

an insole made of plastic wires and fastened to said recessed top chamber in flush with the top side wall of said sandal body, said insole having open spaces through which sands can be carried away from the top side wall of said sandal body to the bottom side of said sandal body through said grooves and said drain waters by water.

6,014,822

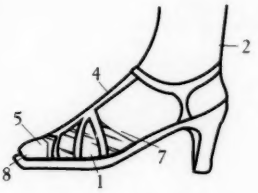
FOOT COVER INSERTS FOR SANDALS

Catherine V. Smith, 4244 E. 131st. Pl., Thornton, Colo. 80241

Provisional application No. 60/071,206, Jan. 12, 1998. This application Jan. 7, 1999, Appl. No. 226,834.

Int. Cl.[7] A43B *19/00*

U.S. Cl. 36—10 **1 Claim**



1. A foot cover insert adapted to be slid over a wearer's foot and to cover the instep and sides of the foot for keeping feet inside straps of sandal shoes, said foot cover insert consisting of:

an upper consisting of a clear, smooth, firm, pliable, vinyl material; and

a flat sole consisting of a thin cork material;

said upper and sole joined together at their edges to form a tubular shaped member with an enlarged first opening to permit the insert to be slid over the foot of the wearer, and an enlarged second opening at the front of the tubular member, said insert adapted to cover only the portion of the foot between the toes and the instep, wherein the foot cover insert can be removed and placed in any type of sandal and give a smooth and perfect look to the foot hiding imperfections of the foot and keep the foot within the boundaries of the sandal.

6,014,823

INFLATABLE SOLE LINING FOR SHOES AND BOOTS

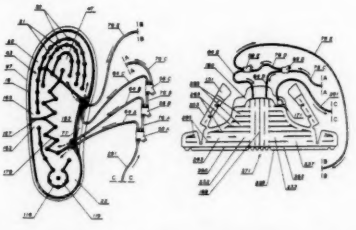
Nikola Lakic, 45-191 Elm St., Indio, Calif. 92201

Continuation of application No. 07/636,603, Dec. 31, 1990, abandoned, which is a continuation-in-part of application No. 07/539,978, Jun. 18, 1990, abandoned, which is a continuation-in-part of application No. 07/427,515, Oct. 27, 1989, Pat. No. 5,025,575, which is a continuation-in-part of application No. 07/323,340, Mar. 14, 1989, Pat. No. 4,991,317, which is a continuation-in-part of application No. 07/262,749, Oct. 28, 1988, abandoned, which is a continuation-in-part of application No. 07/230,908, Aug. 11, 1988, Pat. No. 4,941,271, which is a continuation-in-part of application No. 07/177,410, Apr. 4, 1988, Pat. No. 4,845,338, which is a continuation-in-part of application No. 07/093,579, Sep. 4, 1987, Pat. No. 4,823,482, which is a continuation-in-part of application No. 07/054,189, May 26, 1987, Pat. No. 4,782,602. This application Aug. 17, 1992, Appl. No. 931,025.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A43B *7/14;13/20;7/06*

U.S. Cl. 36—93 **20 Claims**



1. The combination of footwear having an outer sole and an attached outer upper with an inflatable lining received within said footwear for support therein against selected flexible, interior sur-

faces of said footwear comprising the tongue, the sole, the rear and opposite interior sides of the footwear, and combinations thereof, and comprising: an air enclosure having flexible walls and being formed of first and second sheets sealed together by a peripheral seam and having a plurality of discontinuous seams forming passageways within said lining and provided with at least one continuous transverse seam to subdivide said sealed interior into at least two sealed chambers, a respective relief valve having an user adjustable valve member in communication with each of said chambers to permit the user to adjust the pressures within said sealed interior chambers independently of each other, an air pump supported on said lining and having an air pump discharge passageway connecting the discharge of said air pump with said sealed interior chambers of said lining, whereby said pump can provide inflation pressure within said chambers of said sealed interior and connector means connecting said air pump discharge passageway to said sealed interior chambers of said lining to apply inflation pressure thereto whereby the user can adjust the resiliency, shock absorbency and comfort of the lining, with said lining, upon inflation, forming exterior air channels between the outer surface of said inflatable lining and the opposite inner surface of said footwear and having said air pump discharge passageway extending from said air pump to said exterior air channels, thereby permitting said air pump to circulate air through said footwear.

6,014,824

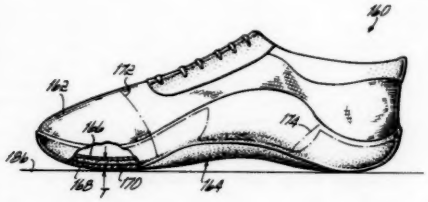
SHOE LAST AND FOOTWEAR MANUFACTURED THEREWITH

Jerry F. Gumbert, P.O Box 92, 3 Main St., Sigel, Pa. 15860

Division of application No. 08/979,421, Nov. 24, 1997, which is a division of application No. 08/518,114, Aug. 28, 1995, Pat. No. 5,718,013, which is a continuation-in-part of application No. 08/327,212, Oct. 21, 1994, abandoned, which is a continuation of application No. 08/032,135, Mar. 17, 1993, abandoned, which is a continuation-in-part of application No. 07/861,460, Apr. 1, 1992, abandoned. This application Dec. 22, 1998, Appl. No. 218,465.

Int. Cl.[7] A43B *13/14;13/00*

U.S. Cl. 36—103 **18 Claims**



1. Footwear for reducing the binding and unnatural pressures placed on a foot by conventional footwear comprising;

a compliant and generally hollow body for receiving a human foot including an upper and a sole attached to the upper, the sole having a contoured bottom surface with a toe region and a heel region and comprising:

an inner longitudinal arch formed on the sole surface and extending from the heel region to the toe region on an inner side of the sole surface;

an outer longitudinal arch formed on the sole surface and extending from the heel region to the toe region on an outer side of the sole surface;

a first transverse arch formed on the sole surface proximate the toe region of the sole surface;

a second transverse arch formed on the sole surface forward of the heel region;

the upper transitioning to the smooth sole surface in a continuous curve free from a sharply angled bottom featheredge;

said longitudinal and transverse arches collectively defining a horizontal cross-sectional area of the footwear body projected downwardly onto a horizontal ground plane, the inner longitudinal arch having a maximum vertical height above the ground plane;

a parting line defining a maximum cumulative horizontal cross-sectional area of the footwear body projected to the ground plane;

the footwear further characterized wherein:

the cumulative cross-sectional area projected downwardly onto said ground plane by said footwear body from a height above the ground plane of approximately 2.5% of the maximum arch height is approximately in the range of 10% to 20% of said maximum cumulative cross-sectional area; and

the cumulative cross-sectional area projected downwardly onto said ground plane by said footwear body from a height above the ground plane of approximately 5% of the maximum arch height is approximately in the range of 20% to 35% of said maximum cumulative cross-sectional area;

the cumulative cross-sectional area projected downwardly onto said ground plane by said foot body from a height above the ground plane of approximately 10% of the maximum arch height is approximately in the range of 50% to 60% of said maximum comulative cross-sectional area;

whereby the footwear generally cooperates with the human foot and reduces binding and unnatural pressures to the foot when worn.

6,014,825

BUCKET WHEEL EXCAVATOR

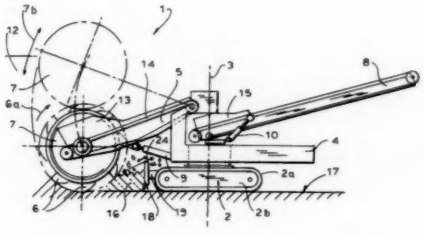
Dieter Jahn, Magdeburg, and Bernhard Wiechers, Bad Oeynhausen, both of Germany, assignors to Krupp Fordertechnik GmbH, Essen, Germany

Filed Nov. 3, 1998, Appl. No. 185,105

Claims priority, application Germany, Nov. 7, 1997, 197 49 246

Int. Cl.[7] E02F *5/08*

U.S. Cl. 37—91 **3 Claims**



1. A bucket wheel excavator comprising:

a crawler bogie having an end and a pair of lateral limiting edges;

a driven bucket wheel and means for mounting said bucket wheel at said end of said bogie so that said bucket wheel is spaced ahead of said bogie, said bucket wheel having a multiplicity of earth-receiving members;

at least one scraper blade mounted on said bogie at said end and extending laterally of said bogie by predetermined distances beyond each said lateral limiting edge thereof; and

hydraulic cylinders mounting said scraper blade on said bogie:

for varying a spacing between said scraper blade and said receiving members of said bucket wheel

for raising and lowering said scraper blade relative to said crawler bogie, and

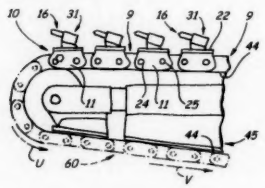
for inclining said scraper blade about a horizontal axis extending parallel to a longitudinal axis of said scraper blade.

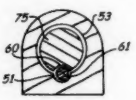
6,014,826

CHAIN FOR TRENCHER APPARATUS

Craig B. Walgren, 210 Comanche La., and John H. Walgren, 1530 County Shire, both of Lake Havasu City, Ariz. 86403

Filed Jun. 24, 1997, Appl. No. 881,821
Int. Cl.[7] E21C *35/18*
U.S. Cl. 37—456 **7 Claims**





1. Excavation apparatus including

(a) a frame including means engaging the ground to enable said frame to move over the ground;

(b) a plurality of tooth sleeves attached to and extending away from said frame, each of said tooth sleeves including an aperture formed therein;

(c) a plurality of teeth each mounted in one of said apertures and including

a cylindrical body having a longitudinal axis (S), said apertures each being shaped and dimensioned to slidably receive said cylindrical body and permit said body to rotate therein, and

a bit attached to said body and extending outwardly away from said one of said apertures;

(d) a slot formed in each of said apertures, having a longitudinal axis generally parallel to said longitudinal axis of said cylindrical body, and extending away from said cylindrical body of one of said teeth mounted in said aperture; and,

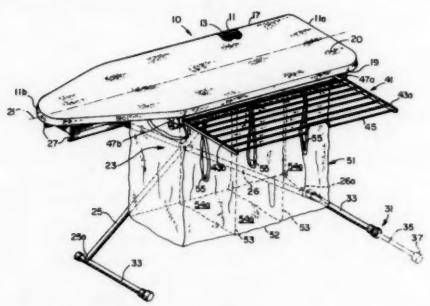
(e) pin means slidably inserted in each of said slots and having a longitudinal axis parallel to said longitudinal axis of said slot, said pin means engaging said cylindrical body of one of said teeth inserted in said one of said apertures to prevent the rotation in said one of said apertures of said one of said teeth.

6,014,827

IRONING BOARD WITH LAUNDRY SORTER AND DRYING RACK

David Lehrman, 207 Barclay Cir., Cheltenham, Pa. 19102

Filed Jan. 7, 1998, Appl. No. 4,139
Int. Cl.[7] D06F *81/04*
U.S. Cl. 38—104 **24 Claims**



1. An ironing board comprising:

a) a table having a top surface to carry out ironing functions thereon, said table having opposing first and second sides bisected by a longitudinal axis,

b) a frame extending from the table for supporting said table, said frame extending from the table at said first side and defining an open area beneath said table, said open area being sized to receive a person seated in a chair to permit the person to carry out ironing functions on the top surface of the table while seated in the chair; and

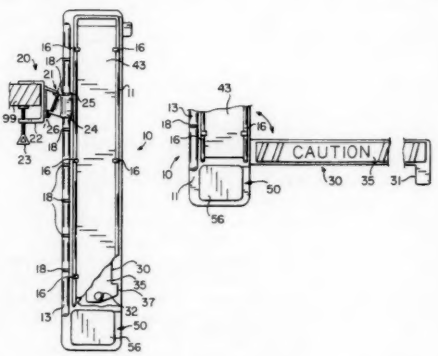
c) a laundry sorter suspended from the table, wherein the laundry sorter comprises a receptacle with a plurality of dividers within the receptacle which form a plurality of compartments.

6,014,828

COMBINATION ADVERTISING AND WARNING SIGN FOR SHELVING

Bruce R. Kern, Suite 390, Jacksonville, Fla. 32256; Don Ladson, 9714 Underwood Ct., Jacksonville, Fla. 32221, and Lewis G. Libby, Suite 390, Jacksonville, Fla. 32256

Filed Jan. 22, 1999, Appl. No. 235,258
Int. Cl.[7] G09F *7/00*
U.S. Cl. 40—492 **20 Claims**



1. A hazard warning sign for attachment to a horizontally disposed shelf having a front edge, the sign comprising:

(A) a generally vertically disposed housing having a generally extended vertical dimension, a relatively shorter lateral dimension, and a thin thickness dimension, said housing comprised of a first face member and a second face member which together define a generally vertically disposed pocket there between to receive a warning arm;

(B) shelf mounting means attached to said housing for mounting said housing onto the front edge of the shelf such that said housing extends generally perpendicular to the front edge of the shelf, where said shelf mounting means comprises a sign bracket attached to said housing and a shelf bracket attachable to the shelf, said sign bracket and said shelf bracket joined by a hinge member; and

(C) a warning arm pivotally connected to said housing, said warning arm positionable in both a vertical and a horizontal position, where said warning arm is disposed within said pocket in said vertical position and is extended laterally from said pocket in said horizontal position.

6,014,829

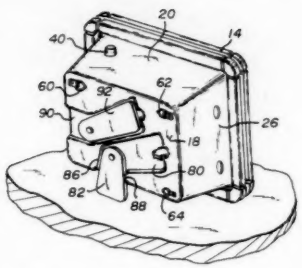
LIGHT BOX FOR COUNTER OR WALL DISPLAY

Nick Wilson, Flossmoor, and Frank Thibideau, East Hazelcrest, both of Ill., assignors to Morrison Timing Screw Company, Glenwood, Ill.

Filed Feb. 16, 1999, Appl. No. 250,586
Int. Cl.[7] G09F *1/10;* **A47G** *1/14*
U.S. Cl. 40—753 **7 Claims**

1. A light box comprising:

a housing having a generally flat rear wall, said wall having an outer periphery edge;



a front wall having an edge and a translucent panel through which light can pass;

side walls extending from the periphery edge of the flat rear wall to the edges of said front wall;

a light source mounted inside the housing, said source being controlled to selectively provide light to said translucent panel, the improvement comprising a flat, generally, planar leg:

a shallow depression in the outer surface of said rear wall shaped to receive said flat leg in a storage position with a loose fit between the longitudinal edges of the depression or in an operational position wherein the leg projects outward from the edge of the rear wall in substantially the same plane as the rear wall;

said leg sized to fit into said shallow depression in said rear wall and pivotally secured to said wall to rotate between said operational position and said storage position, said leg being resiliently flexible so as to be able to bend sufficiently under a normal force to clear undepressed areas of said rear wall when pivoting between said storage and operational positions, but to move back into the depression upon reaching said depression in the absence of a normal bending force.

6,014,830

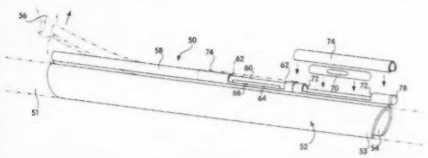
REMOUNTABLE GUN SIGHT FOR LOW ILLUMINATION

Gary R. Brown, P. O. Box 216, and Michael P. Toepel, P.O. Box 343, both of Pittsfield, N.H. 03263

Continuation-in-part of application No. 08/845,066, Apr. 21, 1997, Pat. No. 5,862,618. This application Mar. 25, 1998, Appl. No. 47,538.

Int. Cl.[7] **F41C** *3/14;* **F41G** *21/00;1/00*

U.S. Cl. 42—100 **15 Claims**



6. A gun sight to be attached to a gun capable of firing a projectile along an axis, comprising:

an elongated tubular member having a proximal and a distal end and including aperture therein and therealong and being aligned parallel to said axis and having means for reducing internal light reflections disposed thereon;

a receiver of a self-luminous member disposed at the distal end of said elongated tubular member for providing a light source into the distal end of said elongated tubular member in the absence of ambient light; and

a linear member having a proximal and a distal end and a length substantially corresponding to the length of said elongated tubular member and said receiver, and being attached to said elongated tubular member and including a resilient clip element for attaching said gun sight to said gun.

6,014,831

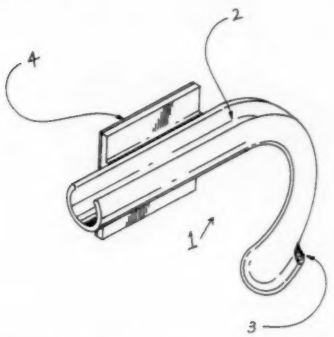
SAFE HOOK PROTECTOR FOR FISHING HOOKS

Sallie B. Curry, 570 S. Main, Pixley, Calif. 93256, assignor to Sallie B. Curry, Pixley, Calif.

Filed Feb. 5, 1998, Appl. No. 19,167

Int. Cl.[7] **A01K** *87/00*

U.S. Cl. 43—25.2 **4 Claims**



1. A safe hook protector for a fishing hook comprising

a J-shaped body having

an elongated shank receiving portion, said elongated shank receiving portion being open at a top portion thereof for receiving the shank of a fishing hook,

an enclosed barb receiving portion for engaging, receiving and enveloping the barb of a fishing hook,

an integrally formed flat substantially rectangular mounting surface having mounting means attached to a side of said mounting surface thereof, and said mounting surface being formed adjacent to a side surface of the elongated shank receiving portion, said mounting surface for mounting said safe hook protector to a fishing rod or a fishing reel.

6,014,832

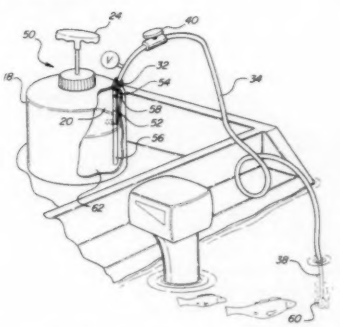
AERATOR AND CHUMMING DEVICE

Kenneth E. Brooks, 505 Farr St., Commerce, Mich. 48382

Filed Dec. 1, 1997, Appl. No. 980,737

Int. Cl.[7] **A01K** *97/02*

U.S. Cl. 43—44.99 **7 Claims**



1. A chumming device comprising:

a tank having an interior chamber and an outlet open to said interior chamber,

means for pressurizing said tank chamber,

a tube having one end fluidly connected with said outlet,

a fish attractant material housed inside said tank chamber, and

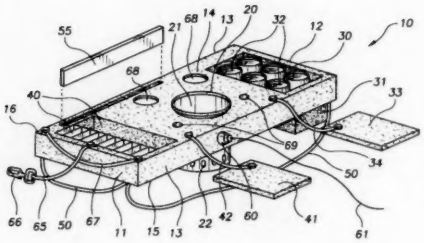
means for dispersing said fish attractant material and air from the other end of said tube.

6,014,833

FLOATING FISHERMAN'S ACCESSORY

Gabriel M. Benavidez, 7300 Arcturas Dr., Sarasota, Fla. 34243

Filed Jul. 15, 1998, Appl. No. 115,864
Int. Cl.[7] A01K *97/05;97/06*
U.S. Cl. 43—54.1 **3 Claims**



1. A floating fisherman's accessory comprising:

a) a foam body member which is rectangular in shape and about thirty six inches long, about four inches tall, about eighteen inches wide, and further includes a top surface, a bottom surface, a front end and a rear end,

b) a central aperture extending through a central portion of the foam body member and dimensioned to receive a five gallon live bait bucket and further dimensioned so that the five gallon bait bucket with a top edge rim will not fall through the aperture,

c) a drink storage container located on a rear end portion of the foam body member, wherein the drink storage container is rectangular in dimensions and extends deep enough into the foam body member so that a twelve ounce drink can be inserted into the storage container, the drink storage container further including a lid which is tetheredly attached to the foam body member,

d) a fishing tackle storage container located on a front end portion of the foam body member and further including numerous bins and storage locations for fishing hooks, lures and tools, the fishing tackle storage container further including a lid which is tetheredly attached to the foam body member,

e) a fish length ruler attached to a side edge of the rectangular foam body member providing a means for measuring the length of fish,

f) a retractable fish stringer attached to a side edge of the rectangular foam body member providing a means for securing fish to the floating fisherman's accessory,

g) a pair of metal skids attached to the bottom surface and extending the length of the foam body member with each skid located near an edge of the foam body member, further wherein said skids extend from the bottom surface a distance which does not allow the five gallon bait bucket to drag terrain when the fishing accessory is dragged across terrain,

h) a tow line attached to a front top edge of the foam body member with a hook attachment attached to an end of the tow line, the tow line providing a means for dragging the floating fisherman's accessory across terrain or water while the hook attachment provides a means for attaching the tow line to a belt loop or waist line of a user,

I) a drag loop line attached to the front top edge of the foam body member and extending along the front top edge of the foam body member wherein the loop line provides a means for the user to easily grab the floating fisherman's accessory,

j) a pair of drink holding apertures located on the top surface of the foam body member which provide locations for storing drinks, and

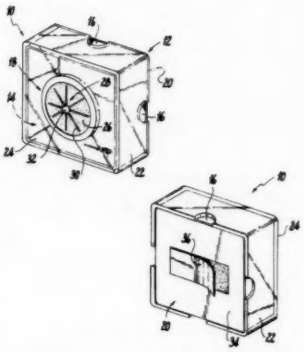
k) a pair of fishing pole apertures located on the top surface of the foam body member which provide locations for storing fishing poles on the floating fisherman's accessory.

6,014,834

INSECT BAIT TRAP

Bret Ferland, 68 Rodney Ave., Islip Terrace, N.Y. 11752

Filed Jun. 8, 1998, Appl. No. 93,289
Int. Cl.[7] A01M *1/20*
U.S. Cl. 43—131 **6 Claims**



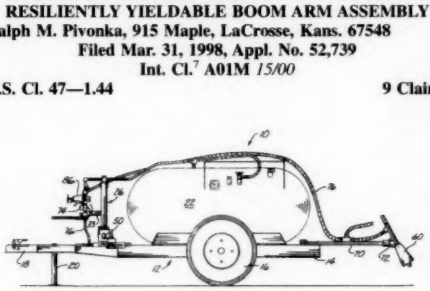
1. A refillable and reusable insect baiter for attracting insects comprising a container defining a chamber holding bait, said container provided with openings for allowing the entry and exit of insects into and from said chamber, and a bait entry portal for the introduction of bait into said chamber, said bait entry portal having an elastomeric closure normally sealing said chamber and openable upon exertion of a pressure thereon to permit introduction of bait into said chamber thereafter being automatically closable upon removal of pressure to seal said container.

6,014,835

TRAILER MOUNTED FLAME CULTIVATOR HAVING RESILIENTLY YIELDABLE BOOM ARM ASSEMBLY

Ralph M. Pivonka, 915 Maple, LaCrosse, Kans. 67548

Filed Mar. 31, 1998, Appl. No. 52,739
Int. Cl.[7] A01M *15/00*
U.S. Cl. 47—1.44 **9 Claims**



1. A flame cultivator, comprising:

a wheeled trailer including ground wheels attached to and supporting a frame, and a hitch extending forward of the frame to attach to a towing vehicle;

a fuel tank supported on the frame;

a boom arm attached to the frame and disposed to extend from a lateral side of the trailer; wherein the first boom arm includes a second boom section telescopically received into a first boom section and the first boom arm is pivotally attached to the frame; is selectively movable between an upwardly extending transport position and a laterally disposed working position, and the second boom section includes a resiliently yielding means for absorbing an impact from contact with a vertical obstruction such that one end of the second boom section will be rearwardly displaced in a horizontal plane relative to the other end of the second boom section;

a torch assembly attached to an outer end of the first boom arm;

a fuel line disposed to interconnect the fuel tank and the torch;

a valve disposed within the fuel line; and

a control mounted on the towing vehicle in proximity to a towing vehicle operator and being electrically connected to the valve, wherein the operator of the towing vehicle can selectively activate the torch from the towing vehicle.

6,014,836

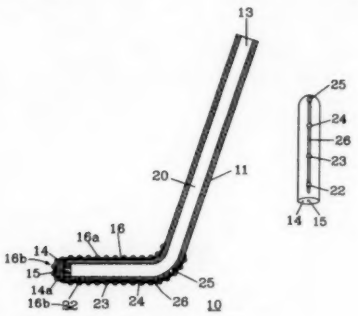
HAND-HELD HERBICIDE APPLICATOR

Steven G. Chester, 1909 Buffalo Bend Dr., Lewisville, Tex. 75067

Filed Dec. 11, 1998, Appl. No. 209,499

Int. Cl.[7] **A01C** *21/00;21/02;* **B05C** *21/00;* **A46B** *11/00*

U.S. Cl. 47—1.5 **9 Claims**



1. A herbicide applicator, comprising:

a handle;

a dispensing end, having a bottom side, connected and extending from said handle at an angle;

a fluid channel inside said handle and extending through said dispensing end;

a plurality of openings in the bottom side of said dispensing end for dispensing a herbicide;

a single channel recessed into said the bottom side of said dispensing end and extending along said bottom side interconnecting at least some of said plurality of openings in said bottom side; and

an absorbent sleeve over said dispensing end and said plurality of openings.

6,014,837

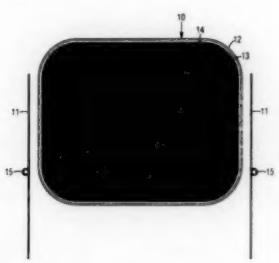
ADAPTABLE PLANT PROTECTOR

Wayne Morgan, 3510 Main St., Soquel, Calif. 95073

Filed Jul. 2, 1998, Appl. No. 109,964

Int. Cl.[7] **A01G** *13/00*

U.S. Cl. 47—31 **8 Claims**



1. An adaptable plant protector, comprising:

a flexible shield comprising a springy bendable frame spanned by a flexible sheet, and a plurality of rings along each of at least two opposite edges of said frame, said springy bendable frame being bendable into a variety of shapes, twistable into a compact coil for storage, and expandable back into shape for use; and

a plurality of bendable rods each comprising a single continuous piece of bendable material, each of said bendable rods having an upper end inserted through at least two of said rings and a lower end for being inserted into the ground, said shield being bendable into said variety of shapes, said shield being supportable in said shapes in a variety of positions when said bendable rods are suitably positioned relative to each other in the ground, bent to suitable angles, and inserted into said rings respectively on said opposite edges of said frame.

6,014,838

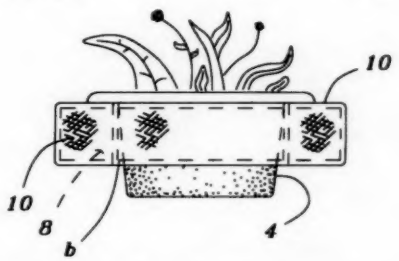
FLOATABLE UNIT FOR DECORATIVE VEGETATION

Connie Maureen Asher, 17460 Hilltop Ridge, Eureka, Mo. 63025

Filed Apr. 17, 1998, Appl. No. 62,016

Int. Cl.[7] **A01G** *31/02*

U.S. Cl. 47—65 **4 Claims**



1. A floatable unit for displaying foliage on ponds, the unit including (a) a plant pot having a cavity adapted to receive soil and foliage, (b) a buoyant float member adapted to receive said plant pot and to float with sufficient buoyancy to support the weight of said plant pot, and (c) means preventing the buoyant float member from being eroded by aquatic animals, said means including a tight fitting screen, said screen being wrapped around surfaces of the buoyant float member exposed to aquatic animals, said screen having a tensile strength sufficiently high so that the screen cannot be readily broken by the aquatic animals.

6,014,839

ELECTRONIC ACTUATOR FOR ARCHITECTURAL SHUTTERS

Bryan K. Ruggles, Salt Lake City, Utah, assignor to Bryan Ruggles, Salt Lake City, Utah

Filed Dec. 5, 1997, Appl. No. 985,572

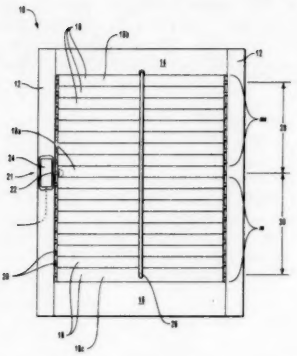
Int. Cl.[7] **E06B** *7/08*

U.S. Cl. 49—74.1 **28 Claims**

1. An electronic actuating system in combination with a shutter assembly having at least one slat rotatably disposed within an interior region defined by a frame of the shutter assembly, said electronic actuating system comprising an electronic actuating assembly for selectively rotating a selected slat of the shutter assembly, said electronic actuating assembly including:

an electronic actuating device at least partially disposed within a corresponding recess in the frame of the shutter assembly and capable of producing actuation forces, the electronic actuating device being housed within an encasement which provides structural reinforcement of the frame; and

a drive spindle having an end configured so as to mate with a corresponding recess in the selected slat and communicating



between the electronic actuatiing device and the selected slat so as to convert actuation forces produced by the electronic actuating device into desired rotational movement of the selected slat.

6,014,840

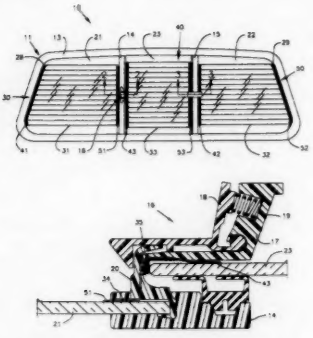
HEATED SLIDING WINDOW ASSEMBLY WITH AN ELECTRICALLY CONNECTED SLIDING PANE

Gary L. Ray, Cassopolis, Mich.; Raymond S. Butler, Elkhart, Ind.; Dennis J. Buening, Northville, Mich.; Michael D. Kobrehel, Elkhart; Todd E. Cripe, Goshen, both of Ind.; Paul M. Eichenberg, Northville, Mich.; Yasmin W. Eloian, Dearborn, Mich.; Charles A. Deperro, Warren, Mich.; Brian J. Czopek, St. Clair Shores, Mich., and Mary M. Inman, Harrison Township, Mich., assignors to Dura Automotive Systems, Inc., Elkhart, Ind.

Filed Dec. 24, 1997, Appl. No. 998,144

Int. Cl.[7] **E05D** *15/06*

U.S. Cl. 49—413 **22 Claims**



1. A heated sliding window assembly comprising, in combination:

a fixed portion comprising a circumferential frame and a fixed pane attached to the circumferential frame, the fixed pane having an electrically conductive heating grid;

a sliding pane slidable within the circumferential frame between an open position and a closed position, the sliding pane having an electrically conductive heating grid;

a first electrically conductive element mounted on the fixed portion; and

a second electrically conductive element mounted on the sliding pane and electrically connected to the sliding pane heating grid, wherein the first and second electrically conductive elements are electrically connected when the sliding pane is in the closed position, and the first and second electrically conductive elements are not electrically connected when the sliding pane is in the open position.

6,014,841

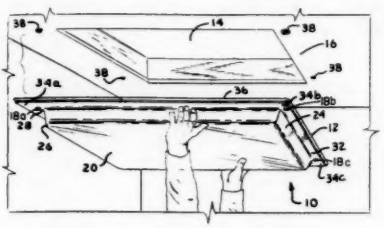
INSULATED COVER FOR ATTIC OPENINGS

George W. McCoy, Jr., 7312 Maywood, Raytown, and George W. McCoy, Sr., 733 Sundown, Independence, both of Mo.

Filed Jun. 1, 1998, Appl. No. 88,020

Int. Cl.[7] **E06B** *3/30;7/00;* **E04F** *19/08*

U.S. Cl. 52—19 **2 Claims**



1. Cover apparatus adapted for positioning adjacent an attic opening for selective closing thereof, said opening defined by peripheral ceiling or wall surfaces, said apparatus comprising:

structure adapted for selective placement in covering relationship to said opening and including

panel presenting an inboard face,

continuous, circumscribing sidewalls extending from said inboard face and each presenting an inner margin adjacent said inboard face and an opposed outer margin, said panel and said sidewalls cooperatively defining an enclosure, and

a continuous, circumscribing flange extending transversely and outwardly from said outer margin, said flange presenting an outermost lip extending therefrom and configured for engaging said surfaces when said structure is detachably coupled to said surfaces, said flange being formed of resilient material capable of deformation of the flange when the structure is detachably coupled with said surfaces;

insulation received within said enclosure and engaging the entire inboard face of the panel and said sidewalls and extending beyond said outer margin whereby to present a face which is substantially coplanar with that of the lip; and

means for detachably coupling said structure to said surfaces including a plurality of snap fasteners,

said snap fasteners each having interconnecting first and second elements, each of said first elements being adapted for attachment to said surfaces proximal to said opening, each of said second elements being secured to said flange inwardly of said lip and configured for interconnection with a corresponding one of said first elements to thereby detachably couple said structure to said surfaces, said lip being deformed when said structure is so coupled, the face of the insulation adapted to engage the proximal surface of the adjacent ceiling or wall surfaces.

6,014,842

MODULAR UNITS, MODULAR STRUCTURES HAVING MODULAR UNITS, AND METHOD FOR CONSTRUCTING MODULAR STRUCTURES

Hideo Matsubara, 1-1-1001, Kita 5-jo Nishi 29-chome, Chuo-ku, Sapporo-shi, Hokkaido, Japan

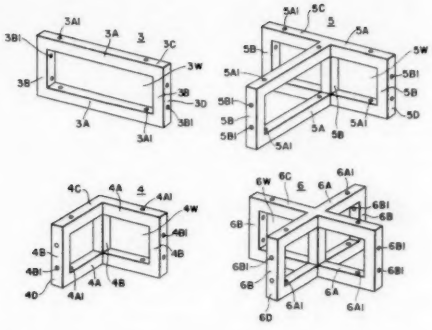
Filed Dec. 3, 1997, Appl. No. 984,711

Claims priority, application Japan, Dec. 4, 1996, 8-340646

Int. Cl.[7] **A63H** *33/12;* **E04B** *1/10*

U.S. Cl. 52—79.12 **36 Claims**

24. A building system comprising: a building having a foundation, a roof structure, a wall structure for supporting the roof



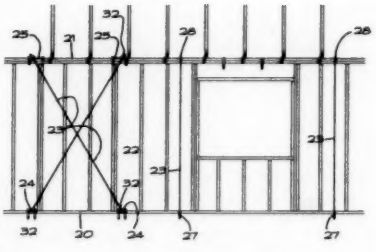
structure, and a floor structure for supporting the wall structure on the foundation; wherein the roof structure, the wall structure and the floor structure comprise a plurality of generally different modular unit sets each having a plurality of identical modular units, the modular units of each modular unit set having connecting surfaces connected to a corresponding connecting surface of at least one other identical modular unit or to a corresponding connecting surface of one of the modular units of another of the modular unit sets to define the roof structure, the wall structure and the floor structure, the modular units of four of the different modular unit sets respectively comprising blocks having a generally I-shaped outline, a generally L-shaped outline, a generally T-shaped outline and a generally X-shaped outline.

6,014,843

WOOD FRAME BUILDING STRUCTURE WITH TIE-DOWN CONNECTORS

Harvel K. Crumley, 1097 Lynmoor Dr., NE., Atlanta, Ga. 30319, and Charles T. Brackett, 13440 Gerona Dr. North, Jacksonville, Fla. 32246

Filed Feb. 13, 1998, Appl. No. 23,445
Int. Cl.[7] E04H *9/02*
U.S. Cl. 52—167.3 **28 Claims**



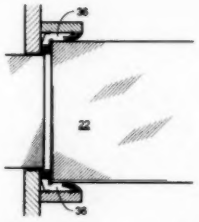
1. In a wood framed building including a foundation and walls constructed of a plurality of parallel vertical studs separating horizontal floor plates from horizontal ceiling plates, comprising a plurality of spaced lengths of wire rope strengthening wherein said walls against destructive wind and seismic forces, said of lengths of wire rope being stretched between said floor plates and said ceiling plates, said lengths of wire rope having bulbous terminals at respective ends of said lengths of wire rope stretched between said floor and ceiling plates, connector means attached to structural components of said building for securing said bulbous terminals.

6,014,844

WEDGED DRAFT PAD

Gregory J. Thill, Dubuque, Iowa, assignor to Rite-Hite Holding Corporation, Milwaukee, Wis.

Filed Sep. 22, 1998, Appl. No. 158,673
Int. Cl.[7] E04F *10/00*
U.S. Cl. 52—173.2 **16 Claims**



1. A draft pad for a lower inner corner of a dock shelter, said dock shelter being on an exterior side of a building and disposed generally along lateral edges of a doorway to help seal a vertical gap that may otherwise exist between said doorway and a back end of a truck, said dock shelter including a projecting member that extends outward from said building in a forward direction, and a laterally extending member extending from the projecting member and pointed generally inward toward said truck, said draft pad comprising:

a mounting surface defined by an upper mounting edge and a lower edge, said draft pad being attachable to the projecting member with said mounting surface facing the projecting member;

a bottom surface extending from said lower edge;

a top surface extending from said upper mounting edge, said top surface and said bottom surface being joined at a side edge; and

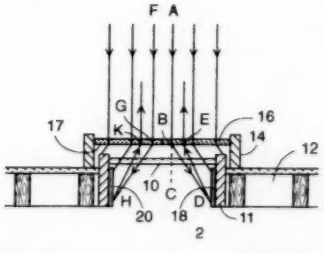
a forward relief surface being joined to said bottom surface at a lower forward edge, said lower forward edge extending farther in said forward direction than most of said forward relief surface to provide a wear relieving clearance between said forward relief surface and said laterally extending member.

6,014,845

ENERGY-EFFICIENT SOLAR SHADE SYSTEM FOR SKYLIGHTS

Kanti Jain, Briarcliff Manor, and Carl C. Kling, Armonk, both of N.Y., assignors to Anvik Corporation, Hawthorne, N.Y.

Filed May 24, 1993, Appl. No. 66,493
Int. Cl.[7] E04B *7/18*
U.S. Cl. 52—200 **18 Claims**



1. An energy saving skylight cover system, for controlling solar radiation at an incidence angle, defined as the angle between sun and horizon, entering an interior space through a skylight, comprising:

a) a frame (**14**) positionable over such skylight; and

b) an angle-selective radiation controlling windowpane (**16**), having at least one multiple-dielectric coating which redirects

solar radiation impinging on such skylight at an incidence angle greater than a characteristic angle, the angle designed into such skylight, related to its orientation on a roof, including the angle of the roof and the geographical location of the building together with its built-in optimizations of rejection or acceptance of solar heat gain, and which admits radiation impinging on such skylight at an incidence angle less than said characteristic angle.

6,014,846

MULTI-WINDOW SASH AND BATTEN ATTACHMENT STRUCTURE

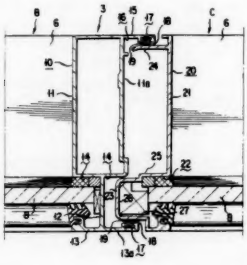
Yasuhiro Sono; So Koike, and Masao Hirano, all of Toyama, Japan, assignors to YKK Architectural Products, Inc., Tokyo, Japan

Division of application No. 08/891,731, Jul. 14, 1997. This application Apr. 27, 1999, Appl. No. 300,281.

Claims priority, application Japan, Jul. 18, 1996, 8-189224; Jul. 18, 1996, 8-189233

Int. Cl.[7] E06B *1/04;1/18;1/38;3/00*

U.S. Cl. 52—204.1 **4 Claims**



1. A multi-window sash comprising a plurality of sash units, to each of which a panel is mounted and which are connected with each other in a panel width direction, and mullion means connecting adjacent two sash units and including at least a mullion having an expandable structure, said expandable mullion means comprising:

a first mullion section having one side surface in a panel width direction provided with a recessed portion and having water-tight member attachments and guide pieces which are attached to respective opposing inner surfaces of the recessed portion; and

a second mullion section fitted to the recessed portion of said first mullion section in the panel width direction,

wherein water-tight members are mounted to the respective water-tight member attachments so as to be pressed against both side end surfaces in a panel thickness direction of the second mullion section and the guide pieces are disposed so as to oppose to both the side end surfaces in the panel thickness direction of the second mullion section with small gaps, respectively, to thereby impart an expandable function to the first and second mullion sections.

6,014,847

LAMINATED ROOFING SHINGLE HAVING STAGGERED SHADOW LINES AND METHOD OF MAKING THE SAME

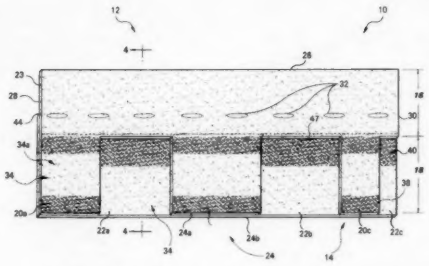
John D. Phillips, Pataskala, Ohio, assignor to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Aug. 31, 1998, Appl. No. 143,897

Int. Cl.[7] E04D *1/28*

U.S. Cl. 52—311.1 **20 Claims**

1. A laminated roofing shingle comprising:



an overlay having an underside and a plurality of spaced apart tabs, each one of said tabs having a leading edge, a first shadow line and a remaining portion, said tabs defining openings adjacent said tabs;

a layer of granules disposed on said first shadow line of said tabs and on said remaining portion of said tabs, said granules on said first shadow line of said tabs being substantially darker in color than said granules on said remaining portion of said tabs;

an underlay attached to said underside of said overlay to cooperatively form said laminated roofing shingle, said underlay having a leading edge, a second shadow line, and a remaining portion between said leading edge of said underlay and said second shadow line, said leading edge of said underlay generally co-aligning with said leading edge of said tabs, said underlay having a portion exposed through said openings defined adjacent said tabs; and

a layer of granules disposed on said underlay, said granules on said second shadow line of said underlay being substantially darker than said granules on said remaining portion of said underlay.

6,014,848

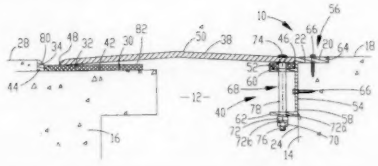
RETROFIT PARKING GARAGE EXPANSION JOINT COVER

Johnnie d. Hilburn, Jr., Wichita, Kans., assignor to Balco/Metalines, Wichita, Kans.

Filed Oct. 30, 1998, Appl. No. 182,963

Int. Cl.[7] E04B *1/68*

U.S. Cl. 52—396.04 **32 Claims**



1. An expansion joint cover apparatus for use in covering a gap between first and second building sections presenting respective first and second support surfaces, the second building section being configured to define a transition recess adjacent the gap presenting a support area below the level of the second support surface and including a recess wall between the second support surface and the recess support area, said apparatus comprising:

a cover plate having a plate width adapted tube greater than the width of the gap, said plate presenting a first edge and an opposed second edge;

coupling means for coupling said plate adjacent said first edge thereof with the first section adjacent the gap, for positioning said plate in covering relationship with the gap and positioning said second edge in said recess, said second edge being slidable in said recess and slidable between the recess and the second support surface during relative movement of the building sections; and

a transition insert configured to mount in the transition recess adjacent the recess wall and including an insert wall configured to provide a beveled transition between the support area and the second-support surface in order to guide said second edge therebetween during relative movement of the building sections and to protect the recess wall from impact by said second edge during said movement,

said coupling means including a mounting bracket and a plate fastener, said plate presenting an upper face, the first building section presenting a wall face adjacent the gap,

said bracket including a web and a bracket flange for extending therefrom, said web being configured to couple with the wall face and to position said bracket flange extending into the gap below the level of the first support surface,

said plate fastener and bracket being configured to couple said plate to said bracket flange so that said upper face of said plate is substantially flush with the first support surface.

6,014,849

JOINING METHOD AND JOINING STRUCTURE AS WELL AS FORM FOR CONCRETE PRODUCTS

Masatsugu Yonemura, Kumamoto, Japan, assignor to Yamax Corporation, Kumamoto, Japan

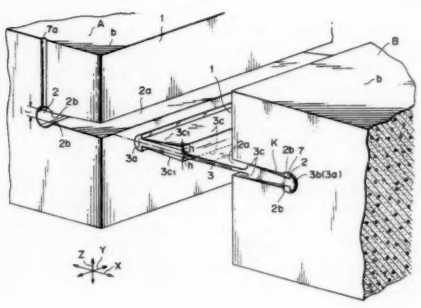
PCT No. PCT/JP96/02960, § 371 Date Jan. 23, 1998, § 102(e) Date Jan. 23, 1998, PCT Pub. No. WO97/45601, PCT Pub. Date Dec. 4, 1997

PCT Filed Oct. 14, 1996, Appl. No. 983,630

Claims priority, application Japan, May 24, 1996, 8-129952

Int. Cl.[7] **E04B** *1/68;* **E01C** *11/02*

U.S. Cl. 52—586.1 **13 Claims**



8. A joining structure for concrete products comprising:

first and second opposed pre-formed concrete products each with a joining face;

a seal member of elastic material attached to said joining face of said first concrete product and including a protruding portion at a front end thereof and a closing press contact portion provided rearwardly of said protruding portion; and

an opening formed in said joining face of said second concrete product, said opening having an attachment hole of enlarged diameter provided at a bottom of said opening, said protruding portion having a thickness which increases away from said closing press contact portion at a rate greater than a rate at which a width of opening,

wherein said protruding portion of said seal member is inserted through said opening into said attachment hole, said closing press contact portion is brought into press contact with inner surfaces of said opening to render an interior of said attachment hole airtight, and wherein grout is filled into a space defined between inner surfaces of said attachment hole and said closing press contact portion and said protruding portion inserted into said attachment hole and set to join said first and second concrete products together by means of said seal member.

6,014,850

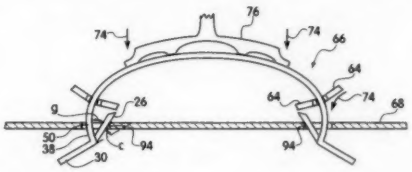
CARRY HANDLE ATTACHMENT SYSTEM FOR PACKAGES

Paul LeMire, Jacksboro, Tenn., assignor to Allen Field Company, Inc., Farmingdale, N.Y.

Provisional application No. 60/043,679, Apr. 14, 1998. This application Apr. 13, 1998, Appl. No. 59,238.

Int. Cl.[7] **B65B** *61/14*

U.S. Cl. 53—134.1 **11 Claims**



10. A system for attaching a carry handle to a package cover in a first hole and in a second hole spaced a predetermined distance from the first hole on the cover comprising:

a first molded one-piece flexible plastic strip handle comprising;

a first end,

a second end,

a top,

a bottom,

a front,

a back, and

a mid-portion having a first plane,

a first wall at said first end extending from said mid-portion,

a second wall attached by one end to said first wall forming a U with said first wall in which the apex of the U is below the first plane,

a tongue extending from said apex toward said second end in an acute angle with said first wall,

first machine element means contacting said strip adapted for bending said strip in a curve in which said tongue extends into said curve;

second machine element means connected to said first machine element means and configured for inserting another end of said second wall of the strip into one of the first and second holes in said cover and for inserting the second end of the bent strip into the second one of the holes in said cover; and

third machine element means for piercing a wrapper on the cover of the container, connected to said first machine element means and configured for piercing said wrapper when said wrapper is over said first hole for insertion of said second wall through the pierced wrapper.

6,014,851

PACKAGE FEED ARRANGEMENT IN A MACHINE FOR THE AUTOMATED PACKAGING OF NEEDLES AND ATTACHED SUTURES

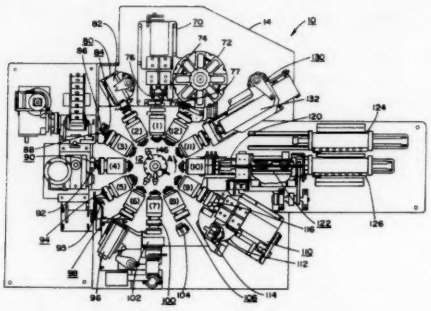
Robert A. Daniele, Flemington; Anthony Esteves, Somerville, both of N.J.; George Horst Reinemuth, Glen Mills, and Richard Paul Branco, Collegeville, both of Pa., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 6, 1998, Appl. No. 20,092

Int. Cl.[7] **B65B** *63/04*

U.S. Cl. 53—430 **28 Claims**

15. A method for feeding a package in a machine for the automated packaging of a single needle having an attached suture to produce a suture package, wherein said machine includes automatically winding said suture within the confines of a tray and attaching a cover to said tray so as to constitute said suture package, said machine having at least one tool nest for supporting said tray, and imparting a forwarding motion to said tool nest and said tray supported thereon for indexed advance to a plurality of workstations stationarily arranged proximate the path of advancing movement of said at least one tool nest; said package feeding method comprising:



(a) at a first workstation mounting an empty said tray on a support surface located on said at least one tool nest; stacking a supply of said empty trays; arranging a rotary plate arranged beneath said stacked trays, said stacked trays being arranged on a carousel having at least two open-bottomed chutes in a circular rotatable arrangement, each chute having a vertical stack of said trays arranged therein, said rotary plate extending closely below the bottom of said chutes so as to receive the bottommost tray therefrom on an upper surface of said rotary plate, indexing said rotary plate forwardly at predetermined angular increments; effectuating engaging said tray on said rotary plate, transferring said tray to the support surface on said one tool nest, and arranging a buffer area adjacent to said upper surface of said rotary plate and containing at least said bottomost tray such that upon a chute being emptied of said trays, an adjacent tray-filled chute is rotated into position above said rotary plate to facilitate the supplying of said bottomost tray to said rotary plate without interrupting the indexing of the rotary plate.

6,014,852

POT WRAPPING APPARATUS AND METHOD

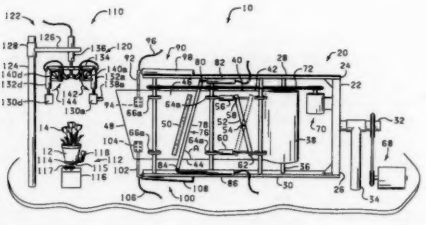
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust Int'l, Inc.

Continuation of application No. 08/854,046, May 8, 1997, Pat. No. 5,813,198, which is a continuation of application No. 08/402,687, Mar. 13, 1995, Pat. No. 5,647,193. This application Sep. 28, 1998, Appl. No. 162,480.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B65B** *11/04;25/02*

U.S. Cl. 53—465 **16 Claims**



1. A method of wrapping a sheet of material about a potted plant, the potted plant having an outer peripheral surface and a bottom surface, the method comprising the steps of:

disposing the potted plant, upon a rotatable support means;

rotating the rotatable support means and the potted plant and drawing the sheet of material about the outer peripheral surface of the potted plant until the sheet of material circumferentially surrounds the potted plant; and

securing the sheet of material in a position about the outer peripheral surface of the potted plant.

6,014,853

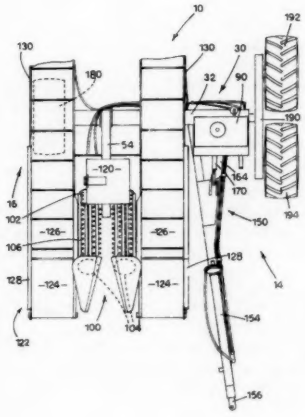
PULL-TYPE TOBACCO HARVESTER

Charles E. Gregory, Sr., 1304 Chauncey Dr., Tarboro, N.C. 27886; Charles E. Gregory, Jr., Rte. 1, Box 101, Hobgood, N.C. 27843, and William A. Slade, P.O. Box 142, Aulander, N.C. 27805

Filed Nov. 3, 1997, Appl. No. 963,328

Int. Cl.[7] **A01D** *45/16*

U.S. Cl. 56—27.5 **19 Claims**



1. A pull-type tobacco harvester having inboard and outboard sides and comprising: a mainframe having inboard and outboard side portions; a leaf defoliating unit mounted on the tobacco harvester for defoliating leaves from the tobacco stalks as the pull-type tobacco harvester is pulled through a tobacco field; at least one wheel mounted to the outboard side portion of the mainframe; at least two tandem wheels mounted to the inboard side portion of the mainframe and wherein the number of wheels on the inboard side exceeds the number of wheels on the outboard side; and an angled tongue secured to the mainframe adjacent the inboard side portion of the mainframe and wherein the tongue is angled relative to the mainframe such that the tongue projects forwardly from the mainframe and towards the path of the tandem wheels and the inboard side of the harvester.

6,014,854

PROCESSING TEXTILE STRANDS

N. Geoffrey Greenberg, Gastonia, N.C., assignor to American & Efird, Inc., Mount Holly, N.C.

Continuation of application No. 08/666,961, Jun. 20, 1996, Pat. No. 5,791,135. This application Apr. 23, 1998, Appl. No. 65,194.

Int. Cl.[7] **D01H** *7/46*

U.S. Cl. 57—290 **1 Claim**

1. A method for manufacturing doubled yarn comprising, in combination, the following steps:

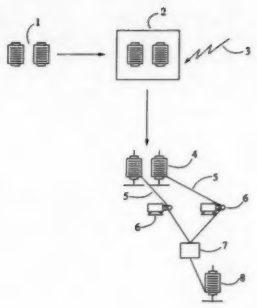
(a) spinning yarn to produce a plurality of small bobbins;

(b) winding the small bobbins to form run-off spools;

(c) heating the yarn from the run-off spools to a temperature greater than ambient while maintaining the pressure greater than atmospheric;

(d) delivering yarn from step (c) to a plurality of constant tensioning devices equal in number to the number of run-off spools;

(e) delivering the yarn from each constant tensioning device to a doubling machine at substantially the same tension; and



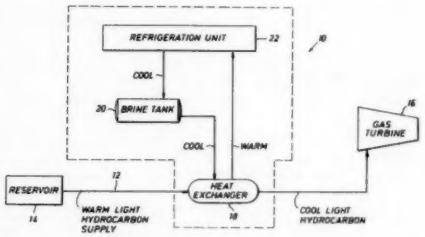
(f) combining the yarns from each constant tensioning device in the doubling machine to produce a single doubled yarn package.

6,014,855

LIGHT HYDROCARBON FUEL COOLING SYSTEM FOR GAS TURBINE

Vince Page, Katy, Tex., assignor to Stewart & Stevenson Services, Inc., Houston, Tex.

Filed Apr. 30, 1997, Appl. No. 846,940
Int. Cl.[7] F02C *7/22*
U.S. Cl. 60—39.06 **17 Claims**



1. A method for supplying fuel to gas turbine engine, the method comprising the following steps:

a. providing a fuel at first temperature;

b. passing said fuel through a cooling system wherein said fuel is cooled to a second temperature lower than the first temperature and below flash point temperature of said fuel; and

c. injecting said cooled fuel into a gas turbine engine.

6,014,856

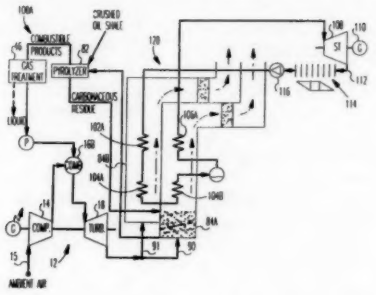
MULTI-FUEL, COMBINED CYCLE POWER PLANT

Lucien Y. Bronicki, Yavne; Joseph Sinai, Ramat Gan; Benjamin Doron, Jerusalem, and Uri Kaplan, Soreq, all of Israel, assignors to Ormat Industries Ltd., Yavne, Israel

Continuation of application No. 08/529,739, Sep. 18, 1995, abandoned, which is a continuation-in-part of application No. 08/307,434, Sep. 19, 1994, abandoned, and a continuation-in-part of application No. 08/329,060, Oct. 11, 1994, abandoned. This application May 20, 1997, Appl. No. 859,329.
Int. Cl.[7] F02C *6/18*
U.S. Cl. 60—39.12 **33 Claims**

1. A power plant comprising:

a) a gas turbine unit having a compressor for compressing ambient air, a burner for heating air compressed by said compressor, a generator, and a turbine coupled to the generator for expanding air heated by said burner to drive said compressor and said generator and producing hot exhaust gases and electricity;



a) a combustor for containing particles of solid fuel;

b) means applying at least some of said exhaust gases to said combustor for fluidizing and combusting said particles in said combustor to produce hot products of combustion that include coarse ash particulate;

c) a pyrolyzer to receive solid fuel, and to receive hot ash from said combustor for producing carbonaceous residue and combustible products;

d) means for supplying said carbonaceous residue to said combustor; and

e) means for supplying said combustible products to said burner; and

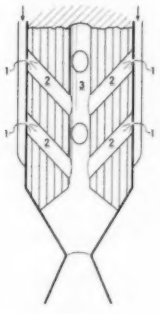
f) additional means for generating power.

6,014,857

HIGH FUEL REGRESSION HYBRID ROCKET MOTOR

Thomas L. Stinnesbeck, Fockenbachstr. 10, 53547 Hummerich, Germany

Filed Nov. 26, 1997, Appl. No. 980,054
Claims priority, application Germany, Dec. 5, 1996, 196 50 411; Dec. 5, 1996, 296 21 110 U
Int. Cl.[7] F02K *9/72*
U.S. Cl. 60—251 **8 Claims**



1. A hybrid rocket motor comprising:

a solid fuel block defining:

a main combustion chamber therein, the combustion chamber defining a first exhaust opening and a first longitudinal axis passing through the first exhaust opening, the combustion chamber conveying combustion gas streams toward the exhaust opening;

a plurality of tubular secondary combustion chambers therein, the secondary combustion chambers being arranged about the main combustion chamber for exhausting into the main combustion chamber in a direction generally transverse to the first longitudinal axis so as to promote mixing of the

combustion gas streams, each of the secondary combustion chambers having a head side and defining on an opposite side a respective second exhaust opening at the main combustion chamber and a respective second longitudinal axis disposed generally transversely to the first longitudinal axis, and each of the secondary combustion chambers having a respective first cross-sectional area generally orthogonal to the respective second longitudinal axis; and

a respective injection orifice associated with the head side of each of the secondary combustion chambers for injecting oxidizer into the associated secondary combustion chamber in a direction generally transverse to the first longitudinal axis;

wherein the first cross-sectional area of each secondary combustion chamber is substantially larger than a second cross-sectional area of the respective injection orifice.

6,014,858

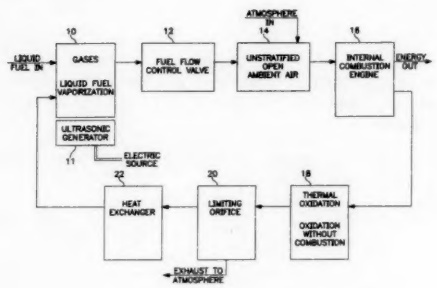
APPARATUS AND METHOD FOR REDUCING HARMFUL PRODUCTS OF COMBUSTION

Arthur Zankowski, 113 Ward Ave., Oxford, N.C.

Filed Aug. 19, 1997, Appl. No. 914,423

Int. Cl.[7] F01N *3/00*

U.S. Cl. 60—274 **25 Claims**



1. A volatile liquid fuel combustion system for substantially reducing harmful products of combustion, said system comprising, in combination:

a. An enclosed vessel containing a quantity of volatile liquid fuel;

b. means for extracting gaseous vapor from said fuel and mixing said vapors with combustion supporting gas;

c. a thermal energy conversion means for oxidizing the fuel vapor-gas mixture;

d. a thermal reactor into which products of combustion from said conversion means are discharged; said thermal reactor having an input for receiving the receiving the products of combustion and an output;

e. flow limiting means connected to the output from said thermal reactor for discharging a first portion of said exhaust to the atmosphere and returning a second portion of said exhaust to said enclosed vessel;

f. means for discharging said second portion at a temperature below the boiling temperature of the liquid fuel, into said vessel below the surface of the liquid fuel therein; and

g. ultrasonic generator means for imparting ultrasonic energy to the second portion of said exhaust products of combustion.

6,014,859

DEVICE FOR PURIFYING EXHAUST GAS OF ENGINE

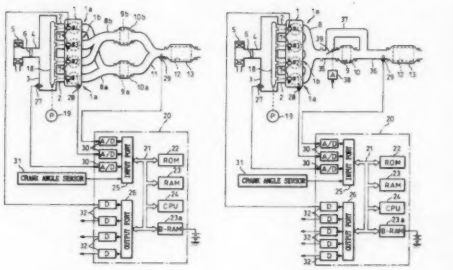
Kouji Yoshizaki, Numazu, and Takaaki Itou, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 19, 1998, Appl. No. 136,766

Claims priority, application Japan, Aug. 25, 1997, 9-228472

Int. Cl.[7] F01N *3/00*

U.S. Cl. 60—285 **28 Claims**



1. A device for purifying the exhaust gas of an engine having an exhaust passage, the device comprising:

an exhaust gas purifying catalyst arranged in the exhaust passage;

a start catalyst arranged in the exhaust passage upstream of the exhaust gas purifying catalyst;

means for forming a gas including oxygen;

means for forming a gas including a reducing agent;

means for forming at least one of the gas including oxygen and the gas including the reducing agent from the exhaust gas of the engine;

means for mixing the gas including oxygen and the gas including the reducing agent and feeding the gas mixture to the exhaust gas purifying catalyst without the gas mixture flowing into the start catalyst;

judging means for judging whether the exhaust gas purifying catalyst is poisoned, wherein a reactivation of the exhaust gas purifying catalyst is performed when the exhaust gas is judged to be poisoned; and

means for obtaining a cumulative fuel amount of the fuel fed to the engine during the usual engine operation, wherein the exhaust gas purifying catalyst is judged to be poisoned when the cumulative fuel amount is larger than a predetermined amount.

6,014,860

AIR SUPPLY ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

Jürgen Schenk, Albershausen; Udo Weist, Walddorfhäslach; Lothar Welter, Ostfildern, and Hans-Christoph Wolf, Stuttgart, all of Germany, assignors to DaimlerChrysler AG, Stuttgart, Germany

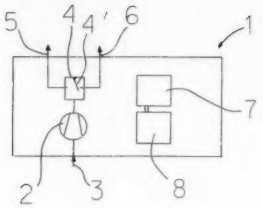
Filed Jul. 15, 1998, Appl. No. 115,887

Claims priority, application Germany, Jul. 18, 1997, 197 30 905

Int. Cl.[7] F01N *3/00*

U.S. Cl. 60—286 **1 Claim**

1. An air supply arrangement for an internal combustion engine, for motor vehicles having means for cooling the engine and means for supplying exhaust gas secondary air to an exhaust system connected to the engine, said arrangement including a single pump driven by a controllable drive means for supplying air to the engine cooling system and to the engine exhaust system, said arrangement including means for switching the air supplied by said air pump to any one of the engine cooing system and the engine exhaust system and a control unit for controlling said controllable drive



means depending on the amount and pressure of the air needed for said cooling system and said engine exhaust system, respectively.

6,014,861

HYDROSTATIC TRANSMISSION

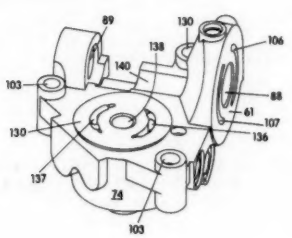
Ray M. Hauser, Decatur, Ill., and Alan W. Johnson, Ames, Iowa, assignors to Hydro-Gear Limited Partnership, Sullivan, Ill.

Continuation of application No. 08/644,474, May 10, 1996, Pat. No. 5,768,892, which is a continuation of application No. 08/613,371, Mar. 11, 1996, Pat. No. 5,616,092, which is a continuation of application No. 08/260,807, Jun. 19, 1994, Pat. No. 5,501,640, which is a continuation of application No. 08/025,272, Mar. 2, 1993, Pat. No. 5,330,394, which is a division of application No. 07/917,858, Jul. 22, 1992, Pat. No. 5,314,387, which is a continuation-in-part of application No. 07/727,463, Jul. 9, 1991, Pat. No. 5,201,692. This application Jan. 30, 1998, Appl. No. 16,584.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] F16D *39/00*

U.S. Cl. 60—487 **4 Claims**



1. A hydrostatic transmission for use in a vehicle to convert rotational power from the vehicle engine to output axle means of said vehicle, comprising,

a hydraulic pump and hydraulic motor;

a center section on which said hydraulic pump and said hydraulic motor are mounted;

porting formed in said center section to operatively connect said hydraulic pump and said hydraulic motor;

a rotatable output drive shaft engaged to said hydraulic motor;

a plurality of bearing openings formed on said center section, said bearing openings integrally formed with and extending from said center section, whereby said output drive shaft is fully supported by said bearing openings.

6,014,862

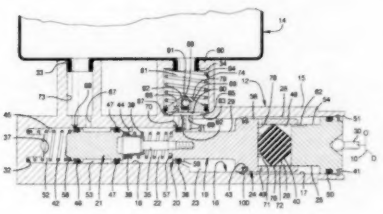
EMULATOR DAMPING MECHANISM

Schuyler Scott Shaw, Dayton, and Donald Edward Schenk, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1998, Appl. No. 48,491

Int. Cl.[7] F15B *21/12*

U.S. Cl. 60—533 **12 Claims**



1. An emulator damping mechanism comprising:

a master cylinder having a body with a stepped master cylinder bore and a transverse bore open to the master cylinder bore;

a brake pedal for actuating the master cylinder;

a reservoir carried near the body and communicating with the transverse bore with a compensation port extending through the body between the transverse bore and the master cylinder bore;

a primary piston unit slidably carried in the master cylinder bore;

an emulator piston received in an emulator bore wherein the emulator piston is slidable within the emulator bore when the primary piston is substantially unslidable in the master cylinder bore, wherein a variable chamber is defined adjacent the emulator piston and within the emulator bore so that the emulator piston is movable between an at-rest position and a plurality of apply positions while the primary piston unit remains substantially unmoved wherein the variable chamber is contractible creating a fluid displacement wherein the fluid displacement is proportional to an apply rate of the brake pedal; and

a damping piston slidably carried in the transverse bore and separating the transverse bore into a damping chamber and a compensation chamber wherein the damping piston has a first bore providing a flow restrictive orifice that is continuously open between the damping chamber and the compensation chamber and wherein when the apply rate is low fluid is displaced from the variable chamber to the reservoir through the flow restrictive orifice without moving the damping piston and when the apply rate is high fluid displaced from the variable chamber is accommodated in the damping chamber as the damping chamber expands by movement of the damping piston.

6,014,863

WASTE PROCESSING SYSTEM AND FUEL REFORMER USED IN THE WASTE PROCESSING SYSTEM

Tsutomu Okusawa; Kazuhito Koyama; Masahiko Yamagishi; Shigeo Hatamiya; Taiko Ajiro, all of Hitachi; Megumi Sunou, Naka-gun, and Yukio Ishigaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1997, Appl. No. 959,026

Int. Cl.[7] F01K *7/34*

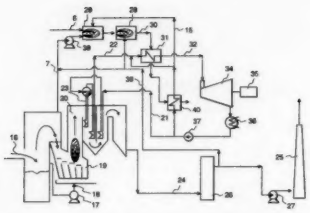
U.S. Cl. 60—653 **14 Claims**

1. A waste-to-energy incineration system, comprising:

an incinerator for burning waste;

a boiler in said incinerator for generating steam by using exhaust heat generated by said incinerator;

superheater for superheating steam generated in said boiler;



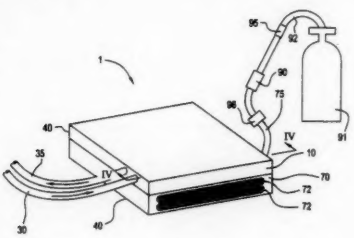
a steam turbine driven by steam superheated by said superheater;
a generator driven by said steam turbine;
a fuel reformer for reforming fuel; and
a combustor burning fuel gas which is reformed by said fuel reformer, and at least a part of an incinerator exhaust gas.

6,014,864

CRYOGENIC FLUID HEAT EXCHANGER METHOD AND APPARATUS

Donald R. Owen, New Orleans, La., assignor to Life Science Holdings, Inc., Chicago, Ill.

Filed Mar. 16, 1998, Appl. No. 39,443
Int. Cl.[7] **F25B** *19/00;* **F17C** *9/02;* **F25D** *11/00*
U.S. Cl. 62—51.1 **21 Claims**



1. A method of cooling a medical fluid, comprising:
receiving and allowing expansion of a compressed cryogenic fluid within a chamber;
flowing a medical fluid through a fluid flow path apparatus disposed adjacent to said chamber so that the medical fluid flows past said chamber;
allowing the transfer of heat between the chamber and the medical fluid within the fluid flow path apparatus; and
maintaining the medical fluid at a predetermined temperature by controlling the distance between the chamber and the fluid flow path apparatus.

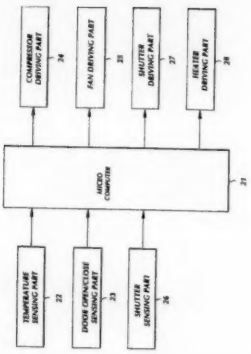
6,014,865

REFRIGERATOR HAVING A DEVICE FOR PREVENTING FLOW OF AIR BETWEEN AN EVAPORATOR AND A COOLING COMPARTMENT

Jae-in Kim, Seoul, and Han-joo Yoo, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 12, 1998, Appl. No. 76,133
Claims priority, application Rep. of Korea, May 15, 1997, 97-18676; May 15, 1997, 97-18677
Int. Cl.[7] **F25D** *21/08*
U.S. Cl. 62—151 **3 Claims**

1. A refrigerator comprising:
a body forming a cooling compartment;
an evaporator for generating cool air to be supplied into said cooling compartment by evaporating refrigerant;



a duct member forming a cool air duct for guiding the cool air generated from said evaporator, said duct member being formed with a plurality of cool air discharge ports opened in said cooling compartment;
a heater for defrosting said evaporator;
a door for opening/closing said cooling compartment;
a means for sensing opening and closing of said door;
a shutting member formed with a plurality of air holes and movable between a port-open position and a port-closed position for opening/closing said discharge ports, respectively:
a motor for driving said shutting member between said port-open and port-closed positions;
a power transmission for transmitting a power of said motor to said shutting member;
a shutter sensor for sensing a position of said shutter member, said shutter sensor including a reed switch installed at a lower part of said power transmission and a magnet installed at a lower part of said shutting member to drive said reed switch when said magnet travels adjacent thereto; and
control means for:
controlling said motor to move said shutter member to said port-closed position during a defrosting operation of said heater and/or when said sensor senses said door being open,
stopping said motor in response to said sensor sensing said shutter member in said port-closed position, and
controlling said motor to move said shutter member to said port-open position after a delay following a defrosting operation, to enable the evaporator temperature to be reduced before air is supplied thereto.

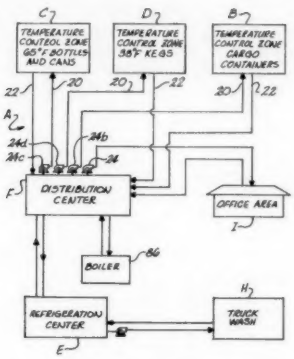
6,014,866

MULTIPLEX SYSTEM FOR MAINTAINING OF PRODUCT TEMPERATURE IN A VEHICULAR DISTRIBUTION PROCESS

James W. Durham, 1727 E. Saluda Lake Rd., Greenville, S.C. 29611

Filed Apr. 17, 1997, Appl. No. 847,833
Int. Cl.[7] **F25B** *19/00;* **B60H** *1/32*
U.S. Cl. 62—201 **45 Claims**

1. A system for maintaining the temperature of food and beverage products located at a warehouse distribution complex comprising:
a plurality of remote temperature control zones located within the warehouse distribution complex;
a refrigeration center connected in fluid communication to said temperature control zones;
said refrigeration center including a primary refrigeration unit which employs a compressible, primary refrigerant;
a source of a secondary fluid which is chilled by said primary refrigerant to provide a refrigerated secondary fluid;
a fluid distribution center for storing said secondary fluid and distributing said secondary fluid to said temperature control zones;



a plurality of main supply lines and main return lines connected in fluid communication between said distribution center and said temperature control zones for supplying and returning said secondary fluid to said distribution center;

a plurality of pumps connected in said main supply lines for selectively delivering said secondary fluid to one of said temperature control zones as the need requires to maintain a desired temperature at a corresponding temperature control zone;

a cargo temperature control zone included in said plurality of temperature control zones which includes a parking area; a plurality of delivery vehicles having cargo containers in which said product is contained for delivery parked at said parking area; and

at least one air handling unit located at said cargo temperature control zone through which said secondary fluid passes in a heat exchange relationship with air to create a refrigerated air flow which is distributed into said cargo container of said vehicle for cooling said product.

6,014,867

REFRIGERATING COUNTER WITH DRAWERS

Jan Egil Fløysvik, Sandnes, Norway, assignor to AB Electrolux, Stockholm, Sweden

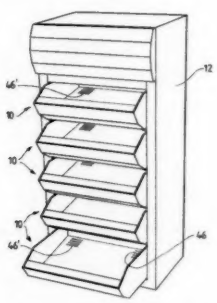
PCT No. PCT/NO96/00208, § 371 Date Feb. 10, 1998, § 102(e) Date Feb. 10, 1998, PCT Pub. No. WO97/06715, PCT Pub. Date Feb. 27, 1997

PCT Filed Aug. 16, 1996, Appl. No. 11,430

Claims priority, application Norway, Aug. 16, 1995, 953211

Int. Cl.[7] A47F *3/04*

U.S. Cl. 62—255 **6 Claims**



1. A counter for continuous, direct, cold air cooling of goods to be cooled and dispensed in a cold condition, said apparatus comprising:

a housing;

a cold air supply system having means for providing cold air, means forming a cold air supply channel in said housing for supplying cold air, and means forming at least one air exhaust channel in said housing for removing used air; and

at least one drawer mounted in said housing for movement between a retracted position in which the goods are cooled and dispensed and an extended position in which the drawer is supplied with goods, said drawer having a front portion from which cooled goods are removed, said drawer having a rear portion into which goods are supplied, said drawing having a bottom member on an upper surface of which goods placed in the drawer rest, said drawer having a depth such that the drawer may contain goods disposed in a disorderly fashion, said rear portion of said drawer having at least one air admission hole that is in fluid communication with said cold air supply channel when said drawer is in the retracted position, said rear portion of said drawer having at least one air discharge hole that is in fluid communication with said air exhaust channel when said drawer is in the retracted position, said drawer having means forming a plurality of passages beneath said bottom member of said drawer, a first one of said passages passing cold air from said air admission hole to the front of said drawer, a second one of said passages passing used air to said air discharge hole, said drawer having cold air dispensing means in said front portion thereof coupled to said first passage and facing toward said rear portion of said drawer for dispensing cold air above said bottom member and onto goods resting on said upper surface of said bottom member, said bottom member having holes adjacent said rear portion of said drawer connecting to said second passage for returning used air to said second passage, said bottom member sloping downwardly in a direction from said rear portion to said front portion of said drawer, the sloping of said bottom member tending to cause the goods to move toward the front portion of said drawer.

6,014,868

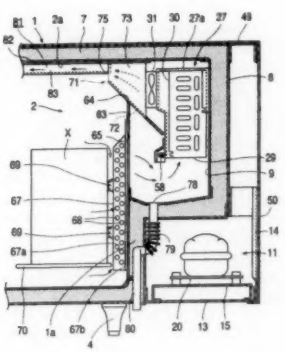
REFRIGERATOR WITH IMPROVED COLD AIR SUPPLY STRUCTURE

Masaru Hirosawa; Tomio Suyama, and Takatosi Torihata, all of Shimane, Japan, assignors to Hoshizaki Denki Co., Ltd., Aichi, Japan

Filed Oct. 20, 1998, Appl. No. 175,567

Int. Cl.[7] F25D *17/04*

U.S. Cl. 62—407 **6 Claims**



1. A refrigerator comprising:

a heat insulating body having a front opening closed and opened by a door and provided with a left-hand side, a right-hand side and a ceiling, thereby defining a cold storage compartment;

a partition member provided on either side of the body and having a blowout hole through which cold air is supplied so as to flow along the ceiling;

a refrigeration unit including an evaporator and supplying cold air produced by the evaporator through the blowout hole into the cold storage compartment; and

a cold air guide member mounted on the ceiling of the body widthwise with respect to the cold storage compartment so as to hang down from the ceiling of the body and to be inclined so that the guide member inwardly retreats as it goes toward a lower end thereof.

6,014,869

REDUCING THE AMOUNT OF COMPONENTS HAVING LOW BOILING POINTS IN LIQUEFIED NATURAL GAS

Wiveka Jacoba Elion; Robert Klein Nagelvoort, and Jan Kornelis Vink, all of The Hague, Netherlands, assignors to Shell Research Limited, London, United Kingdom

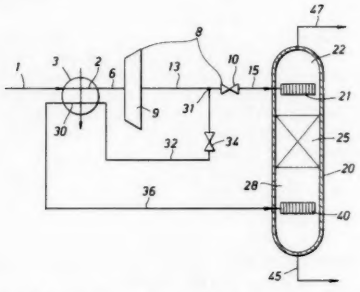
PCT No. PCT/EP97/01000, § 371 Date Aug. 5, 1998, § 102(e) Date Aug. 5, 1998, PCT Pub. No. WO97/32172, PCT Pub. Date Sep. 4, 1997

PCT Filed Feb. 27, 1997, Appl. No. 117,769

Claims priority, application European Pat. Off., Feb. 29, 1996, 96200521

Int. Cl.[7] F25J *3/00*

U.S. Cl. 62—621 **5 Claims**



1. Method of reducing the amount of components having low boiling points in liquefied natural gas, which method comprises the steps of:

(a) passing the liquefied natural gas at liquefaction pressure or at an intermediate pressure through the hot side of an external heat exchanger to obtained cooled liquefied natural gas, allowing the cooled liquefied natural gas to expand to a low pressure to obtain expanded fluid, and introducing expanded fluid into the upper part of a fractionation column provided with a contacting section arranged between the upper part and the lower part of the fractionation column;

(b) passing a direct side stream at low pressure through the cold side of the external heat exchanger to obtain heated two-phase fluid, which direct side stream is a liquid portion of the liquefied natural gas separated therefrom at a point which is upstream of the contacting section in the fractionation column, and suitably separated therefrom at a point which is downstream of the external heat exchanger and upstream of the contacting section in the fractionation column;

(c) introducing the heated-two phase fluid into the lower part of the fractional column and allowing the vapour to flow upwards through the contacting section;

(d) allowing the liquid of the expanded fluid introduced in the upper part of the fractionation column to flow downwards through the contacting section; and

(e) withdrawing from the lower part of the fractionation column a liquid product stream having a reduced content of components having low boiling points, and withdrawing from the upper part of the fractionation column a gas stream which is enriched in components having low boiling points, wherein the expansion from liquefaction pressure to intermediate pressure is done dynamically and wherein the expansion from intermediate pressure to low pressure is done statically.

6,014,870

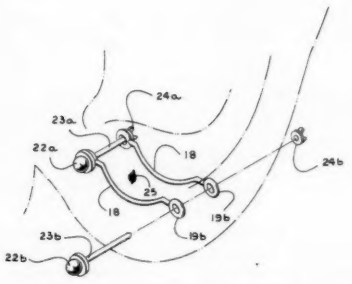
DOUBLE POST EARRING

Joanne A. Horner, and James E. Horner, both of 145 Shoal Creek Rd., Fayetteville, Ga. 30215

Filed Apr. 10, 1998, Appl. No. 58,498

Int. Cl.[7] A44C *7/00*

U.S. Cl. 63—13 **3 Claims**



1. An earring for mounting to the earlobe of a user through which a plurality of holes have been pierced comprising:

a retainer bar assembly having a first rigid member and a second rigid member;

each rigid member having a first end and a second end;

the first end and the second end of each rigid member forming an aperture, the first rigid member being aligned with the second rigid member and the respective first end apertures and second end apertures being aligned;

first and second stud assemblies;

the first stud assembly adapted for mounting through the first end aperture of each rigid member and the second stud assembly adapted for mounting through the second end aperture of each rigid member; and

each stud assembly comprising a stud post and a clasping means to maintain the stud within the respective end aperture.

6,014,871

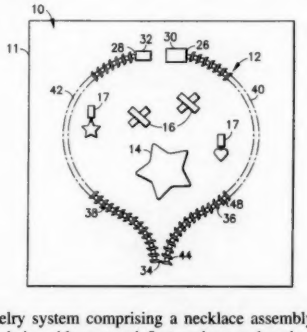
JEWELRY SYSTEM

Teresa J. Romano, 68 W. 82 St. Apt. B, New York, N.Y. 10024

Provisional application No. 60/039,455, Feb. 25, 1997. This application Feb. 25, 1998, Appl. No. 30,473.

Int. Cl.[7] A44C *25/00*

U.S. Cl. 63—41 **10 Claims**



1. A jewelry system comprising a necklace assembly having a decorative chain with opposed first and second ends, releasably lockable primary finding components mounted to the opposed first and second ends of the necklace assembly, first and second auxiliary findings being mounted to said necklace assembly intermediate said opposed first and second ends of said necklace, said first and second auxiliary findings including mateable components releasably locked with one another for permitting portions of said

necklace assembly to be disconnected from remaining portions of said necklace assembly for use as a bracelet, portions of said necklace assembly between said first end and said first auxiliary finding defining a first bracelet component, portions of said necklace assembly from said second end to said second auxiliary finding defining a second bracelet component, portions of said necklace assembly between said first and second auxiliary findings forming a pin component, said system further including at least one connector for releasably joining said first and second bracelet components in substantially parallel side-to-side relationship for forming a double-stranded bracelet, said system further comprising a pin base releasably engageable with said pin component and having pin means for releasable connection of said pin base to an item of clothing.

6,014,872

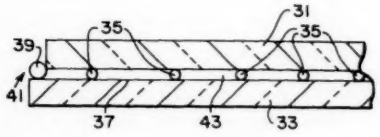
METHODS OF MAKING INSULATING GLASS UNITS WITH NEUTRAL, HIGH PERFORMANCE, DURABLE LOW-E GLASS COATING SYSTEMS

Klaus W. Hartig, Brighton; Philip J. Lingle, Temperance, and Steven L. Larson, Monroe, all of Mich., assignors to Guardian Industries Corp., Auburn Hills, Mich.

Continuation-in-part of application No. 08/552,366, Nov. 2, 1995, abandoned. This application Feb. 27, 1998, Appl. No. 31,840.

Int. Cl.[7] **C03B** *23/24*

U.S. Cl. 65—58 **3 Claims**



1. In a method of making an insulating glass unit comprised of at least two sheets of glass sealed at their peripheral edges to each other thereby to define at least one insulating chamber therebetween, said method including the steps of spacing said glass sheets apart, heating said sheets at an elevated temperature, and sealing the peripheral edges of said sheets to each other at or above said elevated temperature, the improvement comprising using as at least one of said glass sheets a coated glass substrate having on a surface thereof a layer system including the following layers extending outwardly therefrom:

a first layer of Si_3N_4;

a first layer of nickel or nichrome;

a layer of silver;

a second layer of nickel or nichrome; and

a second layer of Si_3N_4;

wherein at least one of said Si_3N_4 layers includes from about 0.5–15% by weight stainless steel, and wherein

when said glass substrate has a thickness of about 2 mm–6 mm said coated glass substrate has a normal emissivity (E_n) of about 0.06 or less, a hemispherical emissivity (E_h) of about 0.08 or less, a sheet resistance (R_s) of about 7.0 ohms/sq. or less and having a substantially neutral visible reflected color when viewed from the glass side.

6,014,873

PROCESS FOR BEND-SHAPING A GLASS PLATE AND AN APPARATUS FOR BEND-SHAPING THE GLASS PLATE

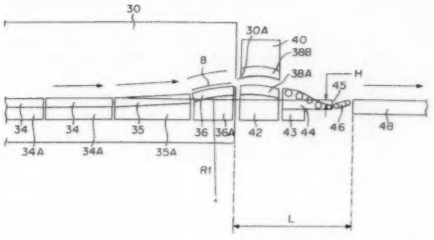
Takashi Hirotsu, Yokohama; Kazuyoshi Ohtani, Sagamihara, and Teruji Nagaoka, Aikawa-machi, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation-in-part of application No. 07/765,889, Sep. 26, 1991, abandoned. This application Mar. 22, 1993, Appl. No. 35,032.

Claims priority, application Japan, Sep. 26, 1990, 2-256229

Int. Cl.[7] **C03B** *40/02;18/00;23/00*

U.S. Cl. 65—104 **6 Claims**



1. A process for bend-shaping a glass plate by heating the glass plate to a temperature which is close to a softening temperature of the glass plate, while the glass plate is transferred in a transferring direction in a shaping furnace, to thereby bend the glass plate, by its own deadweight, the process comprising the steps of:

positioning a plurality of hearth beds in proximity with one another so as to form a transferring surface;

forming a substantially horizontal transfer portion and upwardly convex portion in said transferring surface, said upwardly convex portion extending in the transferring direction within a heating zone in the shaping furnace from the horizontal transfer portion to an exit portion of said heating zone, and said horizontal transfer portion and upwardly convex portion each being formed with a plurality of apertures through which a gas is blown to support the glass plate in a floating state;

positioning a cooling zone outside said shaping furnace at a downstream side of said upwardly convex portion and in proximity with the shaping furnace, said cooling zone having a downward gradient face and being upwardly convexly shaped portion along substantially the entire length thereof;

complexly bending the glass plate in the shaping furnace in the transferring direction and in a direction perpendicular to the transferring direction by transferring the glass plate along a complexly bending transferring surface portion of said transferring surface, said transferring surface comprising a first hearth bed of said plurality of hearth beds, said first hearth bed being positioned in said heating zone and having a bend-shaping surface, said first hearth bed having a complexly curved face which is upwardly projected with predetermined radius of curvatures along both an axis in the transferring direction and an axis in the direction perpendicular to the transferring direction, said first hearth bed being formed of a continuous surface having substantially the same radius of curvatures as the surface of the glass plate to be formed, and said first hearth bed having an upward gradient portion at at least an area near said exit portion of the heating zone, the glass plate being bent into a shape which substantially corresponds to the bend-shaping surface of the first hearth bed;

transferring the glass plate through the shaping furnace by utilizing a driving chain having holders for holding the glass plate in a floating state and a pusher for pushing the held glass plate when the driving chain is driven in the transferring direction;

cooling and strengthening the glass plate in said cooling zone by transferring the glass plate, which has been delivered through said exit portion of the heating zone, along a cooling transferring surface in said cooling zone which has a complexly curved face which is substantially the same as the shape of

said first hearth bed so as to be substantially continuous to that of the first hearth bed and which has a downward gradient face along substantially the entire length of the cooling transferring surface; and

holding the glass plate in the floating state by blowing a gas layer from the lower part of the first hearth bed when the glass plate is transferred along the first hearth bed.

6,014,874

YARN GUIDE FOR WEFT KNITTING MACHINE

Masahiro Shima, and Minoru Sonomura, both of Wakayama, Japan, assignors to Shima Seika Mfg., Ltd., Wakayama-shi, Japan

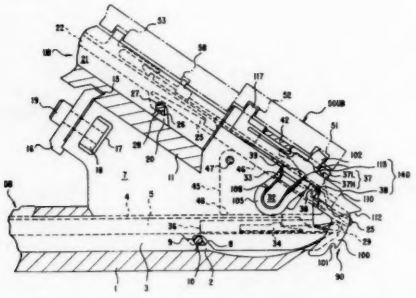
PCT No. PCT/JP97/01628, § 371 Date Sep. 15, 1998, § 102(e) Date Sep. 15, 1998, PCT Pub. No. WO97/43477, PCT Pub. Date Nov. 20, 1997

PCT Filed May 15, 1997, Appl. No. 981,633

Claims priority, application Japan, May 15, 1996, 8-144984; May 13, 1997, 9-139429

Int. Cl.[7] D04B *15/06*

U.S. Cl. 66—106 **8 Claims**



1. A yarn guiding apparatus for a flat knitting machine having at least one pair of needle beds disposed with head portions thereon opposed to each other and knock-out edge portions positioned centrally therebetween, a plurality of needles provided in rows in said needle beds for sliding movements toward said knock-out edge portions and sinkers disposed between said needles and yarn holding members, said yarn holding members each having an operating edge for pushing down yarn at a free end of said yarn holder and supported in parallel to said needles for sliding movement toward said knock-out edge portions, said yarn holder members having deflection means for deflecting said yarn holder members and said yarn therein downwardly toward said needles in said needle beds for engagement of said yarn with said needles.

6,014,875

NEEDLE SELECTION DEVICE, PARTICULARLY FOR SELECTING THE DIAL NEEDLES IN CIRCULAR KNITTING MACHINES

Francesco Lonati; Ettore Lonati; Fausto Lonati, and Tiberio Lonati, all of Brescia, Italy, assignors to Santoni S.p.A., Brescia, Italy

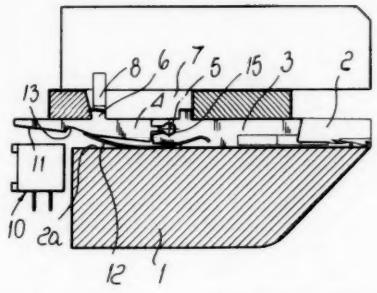
Filed Jul. 15, 1998, Appl. No. 123,393

Int. Cl.[7] D04B *9/00*

U.S. Cl. 66—220 **6 Claims**

1. A combination of a needle selection device in a circular knitting machine, comprising:

needles which are slidingly accommodated in grooves formed in a needle holder and each of which is provided with a pair of lateral faces and a ferromagnetic portion and, at a respective longitudinal end that is furthest from a respective tip, with a respective lever which is pivoted to the respective needle



about a pivoting axis which is substantially perpendicular to a plane of arrangement of the lateral faces of the respective needle, said lever being provided with at least one heel which protrudes transversely from one side of the lever;

needle actuation cams which face said needle holder and form at least one path which can be engaged by said heel of the lever of each of the needles, said needle holder being movable with respect to said needle actuation cams in order to make said levers follow said at least one path for an actuation of the corresponding needle along the corresponding groove of the needle holder parallel to a longitudinal extension of the needle, and for each needle said lever being able to oscillate, about said pivoting axis, from an active position, in which said heel protrudes from the corresponding groove of the needle holder so as to engage the path formed by said needle actuation cams, to an inactive position, in which said heel is inserted in the corresponding groove of the needle holder in order to avoid engaging said path formed by said needle actuation cams;

a reset element which acts on said lever of each needle to move said lever from said active position to said inactive position;

electromagnetic means which face said ferromagnetic portion of said lever for each needle and which can be actuated on command to keep said lever in said inactive position or to move said lever into said active position.

6,014,876

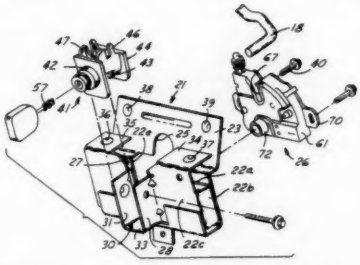
ADJUSTABLE LOCKING FOR HOOD LATCH

Steven Michael Taylor, Birmingham, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jan. 4, 1999, Appl. No. 224,984

Int. Cl.[7] B60R *25/00*

U.S. Cl. 70—240 **7 Claims**



1. A tamper-proof vehicular compartment locking mechanism, the compartment having first and second closure members that come together in relatively close fitting relationship, comprising:

(a) a striker secured within the compartment to one closure member;

(b) a latch mechanism having a movable latch for catching and holding the striker when such striker is brought into a predetermined position relative to the other closure member;

(c) a bracket secured or connected to the other closure member having

(i) walls secured to the latch mechanism for fixing such mechanism in a desired spatial position for receiving the striker,

(ii) a saddle with spaced walls defining a track closed at one end by the saddle; and

(d) a lock having a housing provided with

(i) a tumbler body slidable in and along the track and nestable on the saddle for being secured in an operative position,

(ii) housing flanges at opposite regions of the body that overlap the edges of both the spaced saddle walls, each flange contacting the edges of the side walls at one end of the body to ride thereon, fit flush thereagainst, and stabilize the body in said track, preventing said tumbler body from being pulled out or pushed in,

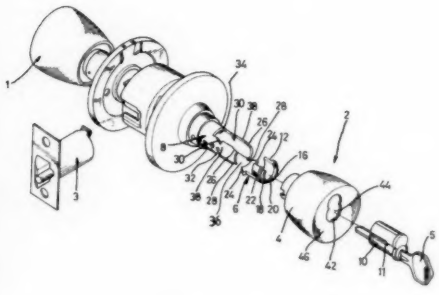
(iii) a pair of ears extending from the body to fit flush with the interior of the respective track walls and prevent twisting of the body therein.

6,014,877

CORE RETAINER FOR A LOCK WITH AN INTERCHANGEABLE LOCK CORE

Mu-Lin Shen, No. 32, Lane 76, Fu-An Road, Sec. 5, Tainan, Taiwan

Filed Feb. 8, 1999, Appl. No. 246,375
Int. Cl.[7] E05B *9/04*
U.S. Cl. 70—371 **2 Claims**



1. An outside handle assembly of a lock, comprising:

a spindle including an upper slot and a lower slot, thereby defining two lateral walls, each said lateral wall including an upper cut defined in an upper side thereof and a lower cut defined in an underside thereof;

a knob connected to the spindle to rotate therewith, the knob including an end wall having an opening defined therein and a projection formed in a periphery that defines the opening; and

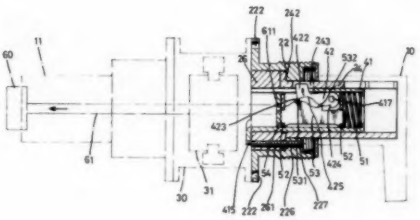
a core retainer mounted in the spindle and including a cylindrical main body including a first end with a flange formed on an outer periphery thereof and a second end, the flange including an outer end face that bears against the end wall of the knob, two retainer lips being formed on the outer end face of the flange and including a cut therebetween for fittingly receiving the projection of the knob to thereby prevent rotational movement of the knob relative to the core retainer, the core retainer further including an insert received in one of the upper slot and the lower slot of the spindle according to door handing, the insert including two lugs extended beyond the second end of the cylindrical main body, wherein the lugs are received in the upper cuts of the spindle when the insert is received in the upper slot of the spindle, and wherein the lugs are received in the lower cuts of the spindle when the insert is received in the lower slot of the spindle.

6,014,878

LOCK WITH A FREELY ROTATABLE OUTSIDE HANDLE

Mu-Lin Shen, No. 32, Lane 76, Fu-An Road, Sec. 5, Tainan, Taiwan

Filed Mar. 2, 1999, Appl. No. 260,751
Int. Cl.[7] E05B *13/10*
U.S. Cl. 70—472 **3 Claims**



1. A lock comprising an inside handle assembly having a push button and a tail piece operably connected to the push button, an outside handle assembly, a latch assembly with a latch bolt, and a chassis having a retractor mounted therein for retracting the latch bolt, the outside handle assembly comprising:

an outside lever handle;

an outside handle spindle secured to the outside lever handle to rotate therewith and including a first slot defined in a periphery thereof;

an actuating spindle mounted in the outside handle spindle and operably connected to the retractor, the actuating spindle including a second slot defined in an upper side thereof and aligned with the first slot of the outside handle spindle;

a catch mounted in the actuating spindle and having a first end pivoted to the actuating spindle and a second end, the first end of the catch further including a hooked portion, the second end of the catch including a block formed on an upper side thereof and an arcuate recess defined in an underside thereof to thereby define a sharp end edge;

a tapping means slidably mounted in the actuating spindle and including a tapping section for releasably engaging with the hooked portion of the catch, the tapping means further including a protruded section for releasably engaging with the second end of the catch, the tapping means being connected to the tail piece to move therewith; and

a spring mounted in the actuating spindle for biasing the tapping section of the tapping means away from the hooked portion of the catch;

wherein when the lock is in an unlocked status, the tapping section of the tapping means disengages from the hooked portion of the catch under the action of the spring while the protruded section of the tapping means engages with the sharp end edge of the second end of the catch such that the block is moved upwardly through the second slot of the actuating spindle into the first slot of the outside handle spindle, thereby allowing synchronous rotational movements of the outside handle spindle and the actuating spindle; and

wherein when the push button is pressed, the tapping means is moved toward the outside lever handle and compresses the spring such that the tapping section of the tapping means engages with the hooked portion of the catch and thus pivots the catch during the sliding movement of the tapping means to move the second end of the catch downwardly, such that the block of the catch disengages from the first slot of the outside handle spindle while the arcuate recess of the second end of the catch engages with the protruded section of the tapping means to allow free rotational movement of the outside lever handle.

6,014,879

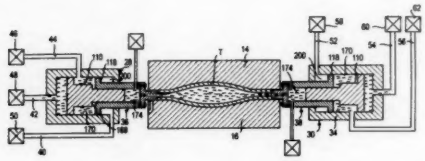
HIGH PRESSURE HYDROFORMING PRESS

Fred G. Jaekel, Richmond Hill, Canada; Frank A. Horton, Rochester Hills, Mich., and Arthur L. Lee, Aurora, Canada, assignors to Cosma International Inc., Concord, Canada

Provisional application No. 60/043,950, Apr. 16, 1997. This application Apr. 16, 1998, Appl. No. 61,094.

Int. Cl.[7] B21D *26/02;39/08*

U.S. Cl. 72—61 13 Claims



1. An apparatus for hydroforming a tubular metal blank comprising:

a die structure having an internal die surface defining a die cavity, said die cavity being constructed and arranged to receive the tubular metal blank;

a hydroforming fluid source;

a hydraulically driven tube-end engaging structure constructed and arranged to engage and substantially seal opposite ends of the tubular metal blank in said die cavity, said tube-end engaging structure being movable to longitudinally compress the tubular metal blank, said tube-end engaging structure constructed and arranged to receive hydroforming fluid from said hydroforming fluid source and having a hydroforming fluid supplying outlet through which hydroforming fluid can be provided to an interior of the tubular metal blank;

a hydraulically driven pressure intensifying structure movable to pressurize said hydroforming fluid provided to the interior of the tubular metal blank and thereby expand a diameter of the blank until an exterior surface of the tubular metal blank generally conforms to that of said internal die surface; and

a single hydraulic power source constructed and arranged to supply hydraulic fluid under pressure to said hydraulically driven pressure intensifying structure and said hydraulically driven tube-end engaging structure, said single hydraulic power source providing said hydraulic fluid under pressure to said hydraulically driven pressure intensifying structure in order to move said pressure intensifying structure and thereby pressurize said hydroforming fluid provided to the interior of the tubular metal blank and expand the diameter of the tubular metal blank so that its exterior surface conforms to that of said internal die surface, said single hydraulic power source providing said hydraulic fluid under pressure to said hydraulically driven tube-end engaging structure to enable said tube-end engaging structure to longitudinally compress the tubular metal blank and cause metal material of the diametrically expanded tubular blank to flow longitudinally in order to replenish a wall thickness of the diametrically expanded tubular metal blank and maintain the wall thickness thereof within a predetermined range, and

a valve assembly communicating said hydroforming fluid source and said single hydraulic power source with said pressure intensifying structure and said tube-end engaging structure,

said valve assembly constructed and arranged to direct hydraulic fluid to selectively i) move said tube-end engaging structure into compression with said opposite ends of said tubular metal blank and ii) move said pressure intensifying structure to pressurize hydroforming fluid within said tubular metal blank so as to expand said tubular metal blank while maintaining the wall thickness of said tubular metal blank within said predetermined range,

said valve assembly being operatively connected with said single hydraulic power source such that movement of said tube-end engaging structure and movement of said pressure intensifying structure can be controlled independently of one another.

6,014,880

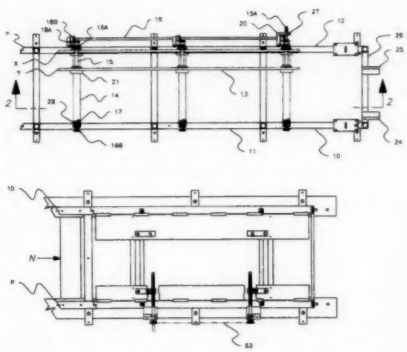
STEEL SIDING MACHINE

Lorne MacDonald, and Don Pockrandt, both of Regina, Canada, assignors to North American Machine Manufacturing Ltd., Saskatchewan, Canada

Filed Jul. 16, 1998, Appl. No. 116,637

Int. Cl.[7] B21D *5/08*

U.S. Cl. 72—181 19 Claims



1. A siding machine for making metal siding, said siding having a formed top edge, a formed bottom edge, and a formed middle portion, from a coil of sheet metal which feeds between upper and lower rolls, said machine comprising:

a flat board former section supported in a framework and comprising:

a fixed position bottom edge former including a plurality of passive upper and lower forming rolls for forming said bottom edge;

a plurality of fixed position driven upper and lower drive roll sets for feeding said sheet metal through the machine; and

an adjustable top edge former, including a plurality of passive forming rolls for forming said top edge;

wherein said top edge former is adjustable with respect to said bottom edge former from a minimum width closest to said bottom edge former to a maximum width farthest away from said bottom edge former;

and a transformer section for receiving a flat formed board from said flat board former section, said transformer section supported in said framework and comprising:

a fixed position driven upper and lower drive roll set for feeding said sheet metal through the machine; and

a plurality of passive upper and lower transformer rolls, for forming a decorative profile in the middle portion of said board, mounted on an adjustable frame, said adjustable frame adjustable, within pre-set limits, perpendicular to the direction of travel of said board such that said transformer rolls may contact and form said board at a chosen location on the face of said board.

6,014,881

ROLLING ROLL PROFILE CONTROL EQUIPMENT

Hiroyuki Imanari, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1999, Appl. No. 280,721

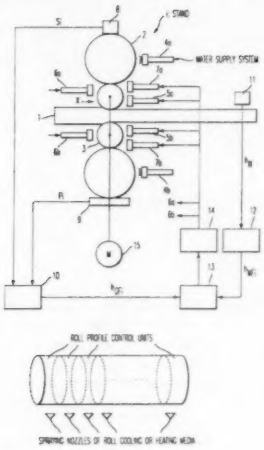
Claims priority, application Japan, Mar. 30, 1998, 10-084192

Int. Cl.[7] B21B *27/06*

U.S. Cl. 72—201 7 Claims

1. Rolling roll profile control equipment, comprising:

roll profile measurement means for dividing an axial direction of a roll of a rolling mill into control units and for measuring the roll diameter of each of control units;



temperature management means at each control unit and including a cooling means for cooling the corresponding control unit and a heating means for heating the corresponding control unit; and

roll profile control means for controlling said temperature management means so that each roll diameters measured by said roll profile measurement means follows a desired value.

6,014,882

PROCESS AND DEVICE FOR ROLLING OUT THE ENDS OF A COILED STRIP IN A REVERSING ROLLING MILL

Bernd Berger, Kaarst, and Franz Brüggen, Menden, both of Germany, assignors to Sundwiger Eisenhutte Maschinenfabrik GmbH, Hemer, Germany

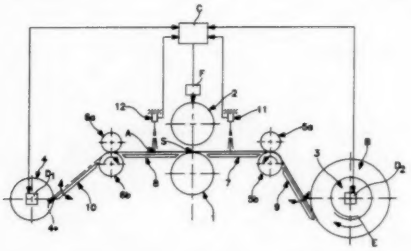
PCT No. PCT/EP96/00534, § 371 Date Nov. 26, 1997, § 102(e) Date Nov. 26, 1997, PCT Pub. No. WO96/25251, PCT Pub. Date Aug. 22, 1996

PCT Filed Feb. 9, 1996, Appl. No. 894,909

Claims priority, application Germany, Feb. 14, 1995, 195 04 711

Int. Cl.[7] **B21B** *41/06;39/08*

U.S. Cl. 72—229 **6 Claims**



1. A method of rolling out an end of a coiled strip in a reversing rolling mill, the rolling mill defining a roll gap and including reels disposed on both sides of the rolling mill, one of the reels serving as a coiling reel and another of the reels serving as an uncoiling reel during operation, the method comprising:

introducing a particular start of the strip into the roll gap without inlet side strip tension and without rolling force at the start of a reduction pass carried out in a particular direction;

gradually increasing the rolling force after the particular start of the strip is introduced into the rolling gap;

reducing the inlet side strip tension substantially to zero at the end of the reduction pass while an end of the strip still connected to the uncoiling reel; and

passing the end of the strip tension-free completely through the rolling gap to effect a reduction in thickness thereof.

6,014,883

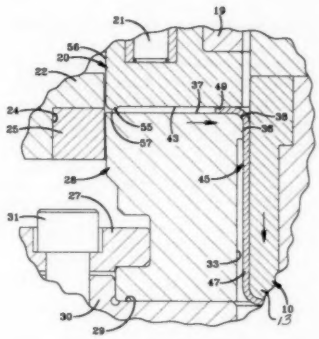
APPARATUS AND METHOD FOR FORMING CUP-SHAPED MEMBERS

James A. McClung, North Canton, Ohio, assignor to Can Industry Products, Inc., Canton, Ohio

Filed Jun. 8, 1998, Appl. No. 93,250

Int. Cl.[7] **B21D** *22/20*

U.S. Cl. 72—347 **15 Claims**



1. In combination, a metal sheet and an apparatus for forming a cup-shaped member from said metal sheet in a press having at least one ram and a base, said apparatus including:

a draw pad and a draw horn carried by the ram and a blank and draw die carried by the base in opposed relationship to the draw pad and draw horn, said draw pad and die having opposed clamping surfaces for releasably clamping a disk blank therebetween;

a cutting edge carried by the ram and surrounding the draw horn for cutting the disk blank from the metal sheet; and

the draw pad clamping surface having an outer rib extending therefrom toward the clamping surface of the blank and draw die for releasably engaging an outer periphery of the disk blank and for subsequently engaging the clamping surface of said die to maintain a predetermined spacing between the clamping surfaces of the die and draw pad as the draw horn advances into the die to form the cup-shaped member from the disk blank, said rib having a height of between 50% and 95% of the thickness of the disk blank.

6,014,884

METHOD OF BENDING TUBING

Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Bloomfield Hills, Mich.

Filed Dec. 11, 1997, Appl. No. 988,618

Int. Cl.[7] **B21D** *7/00*

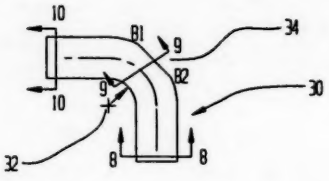
U.S. Cl. 72—369 **12 Claims**

1. A method of bending metal tubing comprising the steps of:

selecting a bend radius less than a standard minimum inside bend radius;

determining a maximum rate of bending of a length of tubing at the standard minimum inside bend radius which will achieve a reduction of flow area of less than 15%;

bending the tubing at a radius of less than said standard minimum inside bend radius at a rate of less than half the



determined rate to achieve a reduction in flow area of less than 15%.

6,014,885

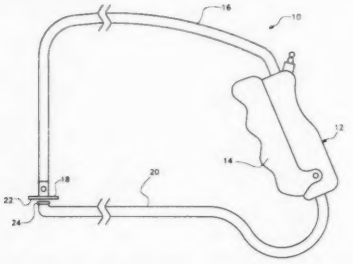
DENT REMOVAL APPARATUS AND METHOD OF OPERATION

Gerald J Griffaton, 1308 Argyle Rd., Berwyn, Pa. 19312

Filed Oct. 27, 1997, Appl. No. 958,424

Int. Cl.[7] B21D *1/06*

U.S. Cl. 72—453.16 **11 Claims**



1. A tool assembly for repairing dents in sheet metal, comprising:

a handle housing having a pneumatic input port disposed thereon;

a first elongated arm having a first end and a second end; wherein said second end of said first elongated arm extends into said handle housing and said first elongated arm is pivotably connected to said handle housing at a pivot point within said handle housing proximate said second end;

a second elongated arm having a first end and a second end, wherein said second end of said second elongated arm is connected to said handle housing;

a pneumatic motor disposed within said handle housing, said pneumatic motor being coupled to said second end of said first elongated arm, wherein said pneumatic motor reciprocally moves said second end of said first elongated arm and causes said first elongated arm to repeatedly move about said pivot point, thereby causing said first end of said first elongated arm to repeatedly move toward and away from said first end of said second elongated arm; and an on/off valve disposed within said handle housing between said pneumatic motor and said pneumatic input port.

6,014,886

GAUGE BLOCK HOLDER APPARATUS

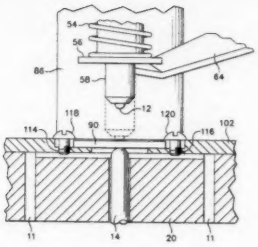
Douglas G. Anderson, and Jason D. Jordan, both of Vancouver, Wash., assignors to SEH America, Inc., Vancouver, Wash.

Filed Jun. 30, 1998, Appl. No. 107,017

Int. Cl.[7] G01B *5/06*

U.S. Cl. 73—1.81 **9 Claims**

1. Holder apparatus for a planar thickness gauge block for use in calibrating caliper-type thickness measurement equipment, wherein the equipment includes an upper movable contact pin and



an opposing lower contact pin fixed relative to a base having a planar upper surface and wherein the equipment provides a thickness indication representing the distance between the upper and lower contact pins, the holder apparatus comprising:

a plate including a planar lower surface for resting flatly on such planar upper surface of such base, said plate further including a generally planar upper expanse, a generally central region of which has machined therein, a through aperture dimensioned to permit entry therein of such lower contact pin and having on either side of said aperture a shoulder region formed by machining a recess into said upper expanse around said aperture, said shoulder region being parallel-planar with said lower surface with the thickness of said plate in said shoulder region being uniformly dimensioned to elevate the shoulder region above such base to the height of an uppermost point of the lower contact, said aperture with said shoulder region therearound being of predefined lateral extent within the plane of said plate to support such thickness gauge on said shoulder region so that such upper movable contact pin is capable of contacting an upper surface of such thickness gauge to provide a readout by the equipment representing the thickness dimension of the gauge block.

6,014,887

SHAFT SELECTION AIDING APPARATUS FOR SELECTING OPTIMUM SHAFT FOR A GOLFER

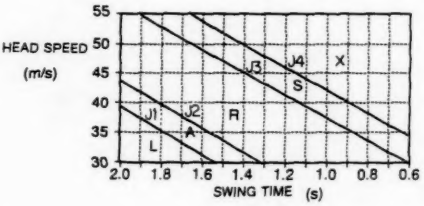
Takeshi Naruo; Takeshi Saito, and Shuichi Noguchi, all of Osaka, Japan, assignors to Mizuno Corporation, Osaka, Japan

Division of application No. 08/656,336, filed as application No. PCT/JP95/02086, Oct. 12, 1995, Pat. No. 5,821,417. This application Nov. 12, 1997, Appl. No. 967,825.

Claims priority, application Japan, Oct. 17, 1994, 6-250474; Jan. 27, 1995, 7-11513

Int. Cl.[7] G01N *3/00*

U.S. Cl. 73—12.04 **5 Claims**



1. A shaft selecting apparatus for selecting a golf club shaft having an optimum flex for a golfer, comprising:

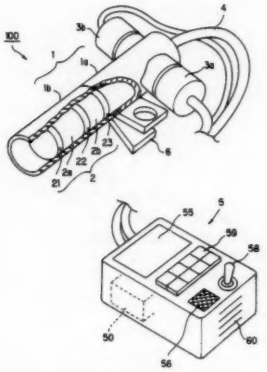
a swing time detection unit for detecting swing time from the start of swinging to impact; and

a selecting unit for selecting the golf club shaft with an optimum flex for said golfer based on the swing time detected by said swing time detection unit.

6,014,888
WORKING ENVIRONMENT DENSITY MEASURING METHOD

Yuji Noritake, Kanagawa; Hisako Murobushi, Tokyo, and Hajime Hori, Kitakyushu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of application No. 08/748,980, Nov. 14, 1996, Pat. No. 5,861,053. This application Sep. 18, 1998, Appl. No. 157,097.
Claims priority, application Japan, Nov. 14, 1995, 7-295862; Nov. 6, 1996, 8-294195
Int. Cl.[7] G01N *30/02;9/00*
U.S. Cl. 73—23.35 **2 Claims**



1. A density measuring method for measuring a density of a material collected in a working environment by a collecting unit configured to collect the material to be measured, said method comprising:

receiving and collecting the material from the working environment in the collecting unit at an upstream side of the collecting unit;

providing a detector configured to detect the material at a downstream side of the collecting unit, said downstream side being a side opposite to the upstream side;

detecting passage of the material through said collecting unit by said detector;

stopping the step of receiving and collecting the material when said passage is detected; and

measuring the density of said material by quantifying the material being collected in said collecting unit until the step of stopping the receiving and collecting of the material.

6,014,889
GAS ANALYZER

Rolf Castor, Hagersten, Sweden, assignor to Siemens Elema AB, Solna, Sweden

Filed Nov. 2, 1998, Appl. No. 184,060
Claims priority, application Sweden, Nov. 25, 1997, 9704329
Int. Cl.[7] G01N *29/02;33/00;* **G01J** *1/42*
U.S. Cl. 73—24.01 **10 Claims**

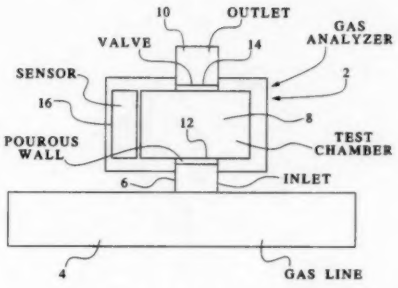
1. A gas analyzer for use in a respirator having an inspiration line with a flow of gas in said inspiration line, said gas analyzer comprising:

a test chamber at a test chamber pressure;

an inlet directly connectible to said inspiration line for admitting a gas sample from said inspiration line into said test chamber;

a gas sensor disposed in said test chamber for analyzing said gas sample for determining a concentration of a constituent gas in said gas sample, said gas sensor being sensitive to gas movements;

shielding means disposed for covering said inlet after said gas sample is admitted into said test chamber for maintaining said gas sample in said test chamber substantially still during analysis of said gas sample by said gas sensor, independently of the flow of said gas in said inspiration line; and

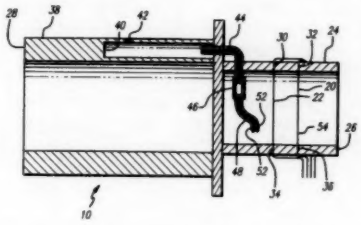


an outlet communicating with said test chamber and communicating with an environment at a pressure which is lower than said test chamber pressure, for passively discharging said gas sample after said gas sample is analyzed by said gas sensor.

6,014,890
FAST RESPONSE HUMIDITY AND TEMPERATURE SENSOR DEVICE

Peter H. Breen, 6 Young Ct., Irvine, Calif. 92612

Provisional application No. 60/027,484, Sep. 25, 1996. This application Sep. 22, 1997, Appl. No. 935,366.
Int. Cl.[7] G01N *19/10;* **A61B** *5/097*
U.S. Cl. 73—29.02 **18 Claims**



1. An airway humidity sensor for measuring the humidity of a gas flow, comprising:

a psychrometer including first and second spaced thermocouples, each formed by the junction of dissimilar metal wires for measuring, respectively, the wet-bulb and dry-bulb temperatures of said gas flow;

means for containing a supply of water;

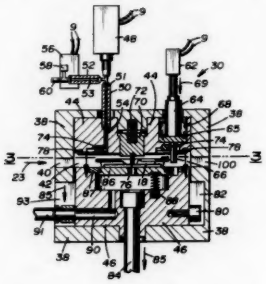
tubing having one end connected to said water supply means and the other end adjacent the junction of said first thermocouple for delivering water to the junction of said first thermocouple whereby to coat said first thermocouple junction while enabling evaporation therefrom, said tubing having a sufficiently small inner diameter to draw water from said supply by capillary action as water evaporates from said first thermocouple junction.

6,014,891
ON-LINE LEAK TESTED AND CONTAINER ENDS

Kelly Kirks, Denver, Colo., assignor to Conal Engineering Inc., Golden, Colo.

Filed May 8, 1998, Appl. No. 74,583
Int. Cl.[7] G01N *3/26*
U.S. Cl. 73—40 **14 Claims**

1. A container end leak testing device used for testing a container end, the testing device under computer control and receiving



outside test air pressure for testing for leaks in the surface of the container end, the testing device comprising:

a tester housing having an upper housing member, a lower housing member and a test pocket therebetween, said test pocket adapted for receiving and holding the container end therein, said upper housing member stationary in said tester housing, said upper housing having a pair of spaced apart downwardly extending guide pins and a downwardly extending retractable stop pin, said guide pins and said stop pin providing for alignment and centering of the container end when received in said test pocket and prior to the testing for leaks in the container end, said lower housing member retractable in said tester housing, said lower housing member retracted downwardly in said tester housing prior to when the container end is received in said test pocket, said lower housing member retracted upwardly in said tester housing for compressing the container end in said test pocket when testing the container end for leaks; and

a pressure transducer connected directly to said upper housing member and communicating with said test pocket via a first air passage in said upper housing member, said pressure transducer able to test for small volumes of air pressure leaks in the container end;

said lower housing member having a second air passage therein for introducing test air pressure against the bottom of the container end in said test pocket.

6,014,892

TRACER GAS LEAK DETECTOR

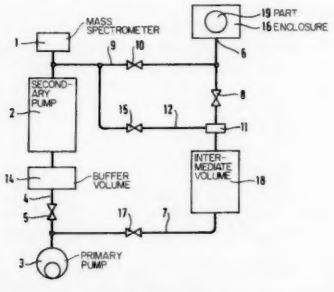
Gilles Baret, Annecy; Roland Gevaud, Argonay, and Alain Devance, Ugine, all of France, assignors to Alcatel, Paris, France

Filed Apr. 2, 1998, Appl. No. 53,769

Claims priority, application France, Apr. 3, 1997, 97 04077

Int. Cl.[7] G01M *3/20*

U.S. Cl. 73—40.7 **14 Claims**



1. A tracer gas leak detector that analyzes a test gas for presence of a tracer gas therein, comprising

a gas analyzer,

a secondary pump whose suction inlet is connected to the gas analyzer,

a primary pump connected directly to the outlet of the secondary pump via a first pipe fitted with a first valve, and

a second pipe connecting the first pipe from a point situated between said first valve and said primary pump to a detector inlet for connection to an enclosure, said second pipe being fitted with a second valve, said primary pump serving to pre-evacuate said enclosure via a pre-evacuated flow and said gas analyzer receiving said test gas from a part of said pre-evacuated flow,

wherein a sampling member for sampling a flow travelling along said second pipe is situated directly on a wall of said second pipe in direct contact with said flow and is connected via a bypass duct directly to said analyzer, said sampling member having flow conductance enabling a pressure in said duct to be compatible with operation of said gas analyzer while said second pipe is at a pressure greater than 10 mbar.

6,014,893

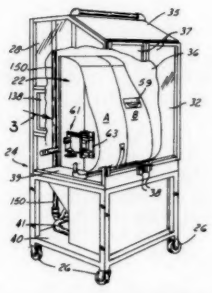
TEST FIXTURE

David B. Reed; Mark Cooper, both of Detroit; Kenneth E. Rosink, Dryden, and Henry J. Ziaja, Dearborn, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 11, 1998, Appl. No. 132,942

Int. Cl.[7] G01N *3/04;17/00*

U.S. Cl. 73—49.7 **8 Claims**



1. A test fixture to test for possible leakage past an elongated seal between adjacent portions of first and second test panels, comprising,

a housing forming a chamber having an open front defined by annular sealing means,

support means for supporting the panels on the housing in substantially co-planar edge-to-edge relation across the open front of the chamber with the seal contacting both of the panels,

means for moving said support means toward the open front of the chamber to cause the panels to seal against the sealing means defining said open front, and

liquid supply means for directing liquid against the seal to determine whether the seal will prevent leakage.

6,014,894

MOTOR SENSOR SYSTEM

Bobby Joe Herron, 14500 Porteaux Bay Dr., N. Biloxi, Miss. 39532

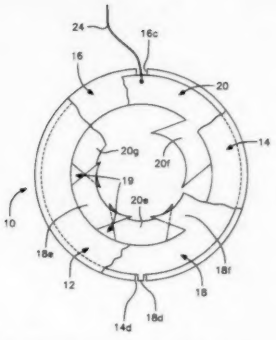
Filed May 12, 1998, Appl. No. 76,062

Int. Cl.[7] G01N *33/20;* **F01M** *1/18;* **G08B** *17/10*

U.S. Cl. 73—61.43 **14 Claims**

1. A sensor assembly for detecting the presence of water in a sealed oil chamber of a marine engine, said sensor assembly comprising:

two electrically conductive elements,



a central insulative element sandwiched between said conductive elements,

at least two different complementary portions of each conductive element extending beyond said central insulative element,

separate gaps being defined between said different complementary portions of said conductive elements,

one pair of complementary portions of said conductive elements defining a gap at a location in the oil chamber where water may collect when the marine engine is at rest,

and another pair of complementary portions of said conductive elements defining a gap at a location in said chamber where water may collect when the marine engine is running,

electrical wires connected to each of said conductive elements,

said wires being part of an alarm circuit normally broken by said gaps, and

said alarm circuit being closed when water in the oil spans at least one of said gaps to thereby activate an alarm.

6,014,895

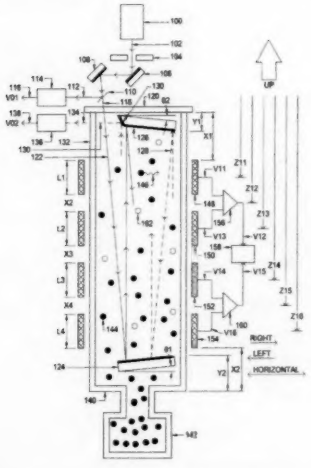
DETERMINATION OF GRAVITY BY OBSERVATION OF DENSITY VARIATIONS IN GASES

William Banning Vail III, 3123-198th Pl. SE, Bothell, Wash. 98012

Filed Sep. 6, 1997, Appl. No. 927,551

Int. Cl.[7] G01V *7/04*

U.S. Cl. 73—382 R **10 Claims**



1. Apparatus to determine gravity having a gaseous mixture comprised of a first and a second molecular species, and possessing a measurement means, wherein said first molecular species has greater mass than said second molecular species, wherein said second molecular species is a buffer gas provided to minimize spurious density variations in said first molecular species, and wherein said measurement means determines the density variations in said first molecular species determine gravity.

6,014,896

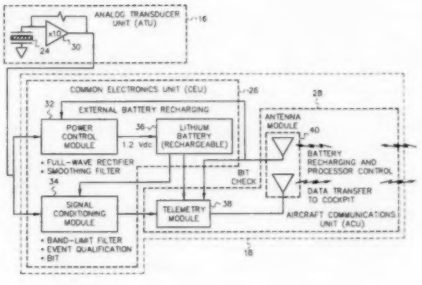
REMOTE SELF-POWERED STRUCTURE MONITOR

Jeffrey N. Schoess, Buffalo, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of application No. 08/690,263, Jul. 24, 1996, which is a continuation-in-part of application No. 08/298,686, Aug. 31, 1994, abandoned. This application Feb. 2, 1999, Appl. No. 241,452.

Int. Cl.[7] G01H *1/00*

U.S. Cl. 73—583 **6 Claims**



1. A remote metal rotating structure monitor, comprising:

an acoustic emission energy PVDF piezoelectric transducer mounted on a metal rotating structure to be monitored for detecting a condition of said metal rotating structure using non repetitive high frequency acoustic emission events of 1 to 10 MHz, stress wave acoustic emission energy and to generate self-contained electrical power from vibrations by said metal rotating structure;

a signal conditioner connected to said transducer to receive stress wave acoustic emission energy therefrom and identify a signal indicative of crack propagation on said metal rotating structure;

a power controller connected to said transducer to selectively use power from said transducer as a secondary power supply source;

a power storage device connected to said power controller and said signal controller to receive and discharge power as determined by said power controller, said power storage device being positioned on said sensor to provide an inertial load; and

a radio frequency telemetry circuit connected to said signal conditioner and said power storage device to transmit data from said signal conditioner identifying crack propagation and transmit power to said power storage device; and

an antenna system connected to said telemetry circuit and said power controller to transmit said data and transmit said power;

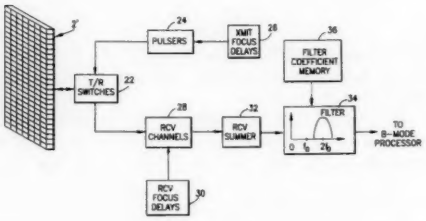
wherein said transducer outputs the electrical power signals due to compression, stretching and/or bending of the sensor caused by the vibration of the structure and enhanced by said inertial load.

6,014,897

METHOD AND APPARATUS FOR IMPROVING SIDELOBE PERFORMANCE OF SPARSE ARRAY USING HARMONIC IMAGING

Larry Y. L. Mo, 1707 Saratoga Rd., Waukesha, Wis. 53186

Filed Sep. 2, 1998, Appl. No. 145,533
Int. Cl.[7] G01N *29/00;* **H04B** *1/06*
U.S. Cl. 73—628 **20 Claims**



1. A system for imaging of ultrasound scatterers, comprising:

an ultrasound transducer array comprising a multiplicity of elements and having a transmit aperture and a receive aperture, said transmit and receive apertures being formed by respective configurations of said elements, at least said configuration of said receive aperture being sparse;

a transmit beamformer for pulsing the transducer elements making up said transmit aperture with wavelets having a fundamental frequency f_0 during a transmit firing;

a receive beamformer coupled to the transducer elements making up said receive aperture of said transducer array for acquiring a beamsummed signal subsequent to said transmit firing;

a filter for passing a harmonic frequency component of said beamsummed signal having a frequency substantially equal to nf_0, where n is a positive integer ≥ 2;

a processor programmed to form an image signal from said harmonic frequency component of said beamsummed signal; and

means for displaying an image which is a function of said image signal.

6,014,898

ULTRASONIC TRANSDUCER ARRAY INCORPORATING AN ARRAY OF SLOTTED TRANSDUCER ELEMENTS

P. Michael Finsterwald, Scottsdale; Stephen Joseph Douglas, Chandler, and Ricky Gail Just, Phoenix, all of Ariz., assignors to Parallel Design, Inc., Tempe, Ariz.

Division of application No. 08/374,251, Jan. 18, 1995, Pat. No. 5,637,800, which is a division of application No. 08/010,827, Jan. 29, 1993, Pat. No. 5,423,220. This application Jun. 9, 1997, Appl. No. 871,211.
Int. Cl.[7] H01L *41/00*
U.S. Cl. 73—642 **25 Claims**

1. An ultrasonic transducer array for testing a body, comprising:

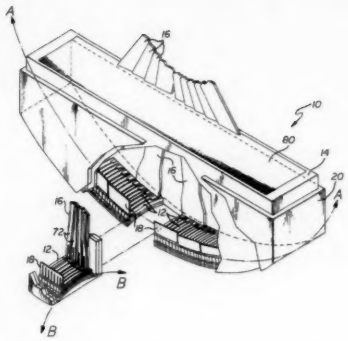
a plurality of transducer elements aligned along an array axis in an imaging plane, each of the plurality of transducer elements including

a piezoelectric layer having a front surface overlaid by a front electrode and a rear surface overlaid by a rear electrode, the front surface being interrupted by a series of slots arranged in directions substantially parallel with the array axis,

a first acoustic matching layer mounted in front of the front surface of the piezoelectric layer, and

an electrically conductive path across the series of slots of the piezoelectric layer,

wherein the piezoelectric layer and at least a portion of the first acoustic matching layer are spaced from the adjacent transducer elements; and



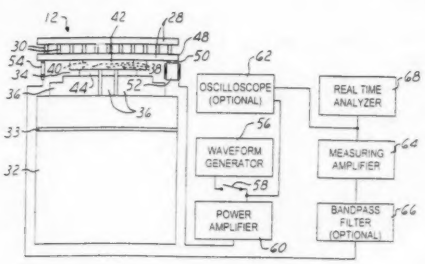
a backing support that supports the plurality of transducer elements in the aligned, spaced-apart relationship along the array axis.

6,014,899

METHOD AND APPARATUS FOR MEASURING VIBRATION DAMPING OF BRAKE PARTS

Robert P. Uhlig, Rochester Hills, and Cheryl A. Fry, Auburn Hills, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Sep. 16, 1997, Appl. No. 931,819
Int. Cl.[7] G01M *7/00;* **G01H** *13/00*
U.S. Cl. 73—664 **12 Claims**



1. A method of measuring vibration damping of a part, comprising the steps of:

(1) vibrating said part at a selected frequency, with a vibrator located adjacent a test portion of said part;

(2) measuring an amplitude of vibration of said part during said vibrating;

(3) deactivating said vibrator such that said amplitude decays;

(4) measuring a decay time of said amplitude over a selected range of decay;

(5) repeating each of said steps 1, 2, 3 and 4 with said vibrator respectively located adjacent each one of a series of spaced apart test portions of said part to obtain a series of decay times; and

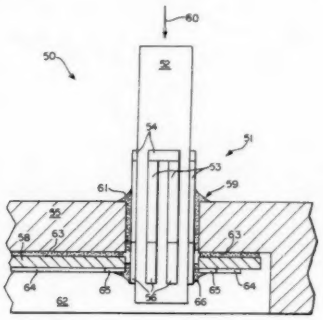
(6) determining a value associated with said series of test portions representative of vibration damping of said part and related to said selected frequency.

6,014,900

Z-AXIS RESISTOR TEST SYSTEM

Robert M. Vandenboom, Markle; David L. Poole, Portland, both of Ind.; Steven L. Steinbrunner, Coldwater, Ohio, and Lewis L. Seffernick, Decatur, Ind., assignors to CTS Corporation

Filed Jul. 22, 1998, Appl. No. 120,917
Int. Cl.[7] G01B *7/16*
U.S. Cl. 73—781 **18 Claims**



1. A test system for performing a test of at least one resistor, comprising:

a) mechanical load application means for holding the resistor and both applying and removing a mechanical force to and from the resistor, respectively;

b) electrical contact means for making and breaking electrical contact with the resistor; and

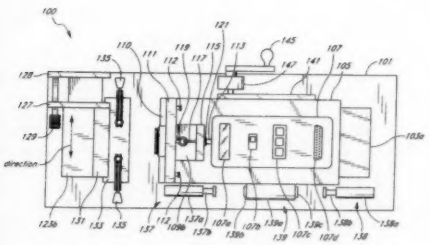
c) electrical measurement means, connected to the electrical contact means, for making electrical measurements with and without the applied mechanical force.

6,014,901

EXTRACTION FORCE TESTER

Craig L. Boe, Nampa, Id., assignor to Micron Electronics, Inc., Boise, Id.

Continuation of application No. 08/851,467, May 5, 1997, which is a division of application No. 08/769,786, Dec. 18, 1996, Pat. No. 5,731,525. This application May 4, 1998, Appl. No. 72,273.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] G01N *3/08*
U.S. Cl. 73—831 **12 Claims**



1. An extraction force tester comprising:

a base;

a tensile force gauge, movably coupled to the base, which measures a force and provides an output indicative of the measured force;

a pin assembly movably coupled to the base, the pin assembly having a plurality of pins for engaging a plurality of sockets of a connector; and

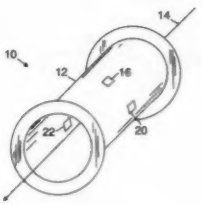
a coupler which couples the pin assembly to the tensile force gauge, wherein the coupler allows the pin assembly to be pulled away from the connector by the force gauge so as to disengage the plurality of pins from the plurality of sockets, thereby enabling the force gauge to measure the extraction force necessary to disengage the plurality of pins from the plurality of sockets and, thereafter, provide an output indicative of the measured force.

6,014,902

MAGNETIC FLOWMETER WITH DIAGNOSTICS

Peter B. Lewis, North Attleboro, and Norman Fonteneau, Acushnet, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Continuation-in-part of application No. 08/580,509, Dec. 28, 1995. This application Nov. 4, 1997, Appl. No. 964,303.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] G01F *1/58*
U.S. Cl. 73—861.12 **12 Claims**



1. A magnetic flowmeter comprising:

a tube for supporting a fluid flow;

an electrode mounted in the tube used to measure a rate of the fluid flow; and

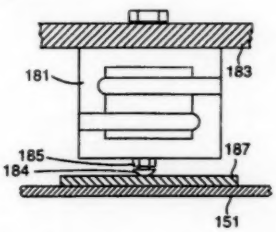
a diagnostic circuit receiving an output of the electrode and providing an output signal which indicates when the electrode is partially fouled.

6,014,903

MASS FLOW MEASUREMENT IN FORAGE HARVESTERS

Gilbert J. I. Strubbe, Loppem, and Bart M. A. Missotten, Leuven, both of Belgium, assignors to New Holland North America, Inc., New Holland, Pa.

Filed Jun. 22, 1998, Appl. No. 100,995
Int. Cl.[7] G01F *1/30*
U.S. Cl. 73—861.73 **10 Claims**



1. In apparatus for measuring a mass flow rate of bulk material in a forage harvester having a discharge spout, said apparatus comprising,

channel means mounted in said discharge spout,

means for establishing a streamline flow of said bulk material along at least one guide surface of said channel means,

a generally rectangular sensor surface installed in a similarly generally rectangular aperture in said channel means,

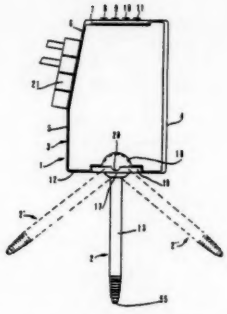
said generally rectangular sensor surface having a plurality of edges disposed adjacent a like plurality of edges of said similarly generally rectangular aperture, and

at least one transducer for measuring a measurable quantity resulting from forces acting on said sensor surface, said forces comprising the force resulting from the flow of said bulk material on the sensor surface, the improvement comprising

said sensor surface is installed in substantial alignment with said guide surface, and

sealing means are provided between said edges of said sensor surface and said edges of said aperture in said channel means,

said sealing means comprise strips of resilient material, permitting a small relative movement of said sensor surface to said channel means.



6,014,904

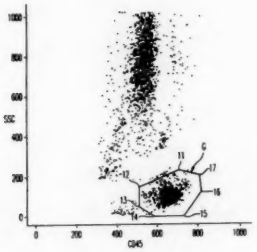
METHOD FOR CLASSIFYING MULTI-PARAMETER DATA

Michael D. Lock, Mountain View, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of application No. 08/724,560, Sep. 30, 1996, abandoned, Provisional application No. 60/017,095, May 9, 1996. This application Oct. 27, 1997, Appl. No. 962,970.

Int. Cl.[7] G06F *15/46*

U.S. Cl. 73—865.5 **20 Claims**



1. An automated method for classifying particles in at least one sample into one or more data clusters, comprising the steps of:

automatically collecting a plurality of parameters for each of a plurality of particles in a sample;

automatically plotting each particle on a two-dimensional scatter plot; and

automatically constructing at least one geometric boundary on the two-dimensional scatter plot so as to enclose a group of the plotted particles in a data cluster, said boundary having a polygonal shape defined by a plurality of vertices and being constructed by creating at least one one-dimensional histogram from a cross-section of the two-dimensional scatter plot.

6,014,905

MEASURING APPARATUS WITH AN ANALOG-DIGITAL DISPLAY UNIT

Stefano Possati, Bologna; Luciano Ventura, Zola Predosa, and Giovanni Gurrieri, Castenaso, all of Italy, assignors to Marposs Societa' Per Azioni, Bentivoglio, Italy

PCT No. PCT/EP96/01873, § 371 Date Oct. 27, 1997, § 102(e) Date Oct. 27, 1997, PCT Pub. No. WO96/35925, PCT Pub. Date Nov. 14, 1996

PCT Filed May 6, 1996, Appl. No. 945,456

Claims priority, application Italy, May 10, 1995, BO95A0214

Int. Cl.[7] G01D *11/24;7/00;18/00*

U.S. Cl. 73—866.3 **24 Claims**

1. A measuring apparatus comprising a display unit with a substantially right parallelepipedon shaped casing, considerably smaller in width with respect to length and depth, two display devices, substantially one of the analog and the other of the digital type, located at a front face of the casing having dimensions corresponding to said length and width, placed adjacent to each other and arranged along the length of the front face, a keyboard for programming and control purposes, and a measuring head, characterized in that the keyboard is arranged at a base of the casing and a coupling device for coupling the display unit to an external support is associated with the casing.

6,014,906

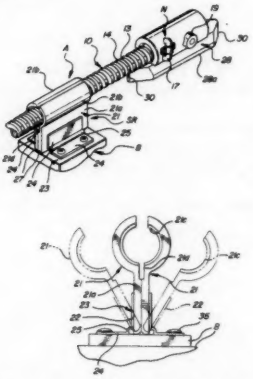
BALL SCREW AND NUT ASSEMBLY INCORPORATING A PARTIBLE MULTIPLE JAW SUPPORT SYSTEM FOR SUPPORTING AN AXIALLY ROTATABLE BALL SCREW

Edward L. Stump, Frankenmuth, Mich., assignor to Thomson Saginaw Ball Screw Company, LLC, Saginaw, Mich.

Provisional application No. 60/080,097, Mar. 31, 1998. This application Aug. 13, 1998, Appl. No. 134,292.

Int. Cl.[7] F16H *27/02;* **B23P** *11/00*

U.S. Cl. 74—89.15 **16 Claims**



1. In a ball screw and nut actuator assembly incorporating an elongate bearing supported rotatable ball screw, the combination, with said screw of:

a. a partible, opposed jaw steady rest support comprising jaw members with opposed curvilinear faces and legs pivotably moveable for lateral swinging movement in opposed directions away from a first position in which said faces substantially compositely embrace the ball screw and engage the circumferential land surface of the ball screw to a removed second spread apart position; and

b. a ball nut on said ball screw providing with said ball screw a raceway for recirculating load bearing balls, for moving said nut axially along said ball screw with rotation of said ball screw, said nut having a spreader on each of its ends interactable upon engagement with said jaw members to automatically move said jaw members from said first position to said

second spread position to permit said nut to pass axially by said steady rest support.

6,014,907

ADJUSTING DEVICE FOR PROVIDING CHANGES OF THE ANGLE OF ROTATION BETWEEN TWO ROTARY ELEMENTS

Ulf Rilbe, Västerås, Sweden, assignor to Scandrive Control AB, Kolback, Sweden

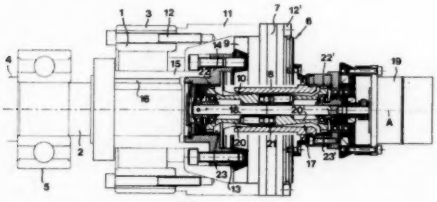
PCT No. PCT/SE97/01485, § 371 Date Feb. 19, 1998, § 102(e) Date Feb. 19, 1998, PCT Pub. No. WO98/13626, PCT Pub. Date Apr. 2, 1998

PCT Filed Sep. 5, 1997, Appl. No. 11,856

Claims priority, application Sweden, Sep. 23, 1996, 9603447

Int. Cl.[7] **F16H** *35/00;* **B41F** *13/008*

U.S. Cl. 74—395 **12 Claims**



1. An adjusting device for providing changes of an angle of rotation between two rotary elements (**1**, **2**), which are driving and driven, respectively, and which under normal operation conditions will be driven at one and the same rotary speed, comprising on one hand a first gear unit (**6**) with a frame body (**7**), the first gear unit acting between the elements and being co-rotatively connected with one of said elements, in order to accompany said one of said elements during rotation, input and output members (**8**, **9**) being rotatable relative to the first gear unit in order to adjust the angle of rotation between the elements (**1**, **2**), and on the other hand a second gear unit (**17**) arranged to cooperate with an adjusting shaft (**18**) that is rotatable between a given, not moving rest position during said normal operation conditions, and another position, the shaft during such rotation driving the second gear unit (**17**) in order to transfer to one (**8**) of the rotary members of the first gear unit (**6**) a relative motion of the angle of rotation, which motion after a gear reduction by means of the first gear unit provides for a restricted change of the angle of rotation between said driving and driven elements (**1**, **2**), wherein the second gear unit (**17**) comprises two eccentric gear components (**20**, **20'**) which are co-rotatively connected via a coupling (**21**) that permits each component separately to perform eccentric translation movements, and which have external gear rings (**22**, **22'**) arranged to cooperate with internal gear rings (**23**, **23'**), one of the internal gear rings is co-rotatively connected with the input rotary member (**8**) of the first gear unit and the other internal gear ring is connected with the output rotary member (**9**), and in that the external gear rings (**22**, **22'**) of the individual eccentric gear components have a smaller diameter and fewer teeth than the appurtenant internal gear rings (**23**, **23'**) and are eccentric relative to the internal gear rings, and each of the eccentric gear components being rotatably mounted on eccenter rings (**25**, **25'**), the eccenter rings being arranged on the adjusting shaft (**18**), of which rings one (**25**) is co-rotatively connected with the adjusting shaft (**18**), while the other ring (**25'**) is permitted to rotate relative to the shaft.

6,014,908

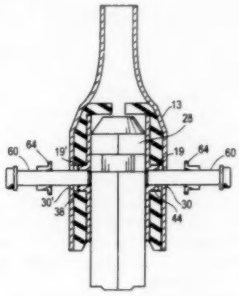
RELEASABLE ATTACHMENT FOR SHIFT HANDLE

Matthew E. Klais, Waterford, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed May 20, 1998, Appl. No. 81,979

Int. Cl.[7] **B60K** *20/00;* **G05G** *1/04;* **F16B** *1/00;* **F16D** *1/00*

U.S. Cl. 74—471 R **6 Claims**



1. A manual shift lever connection mechanism for connecting a shift handle to a stub shaft of a transmission comprising:

a disassembly tool;

a sleeve portion having an interior surface, adapted for disposition about a stub shaft;

an insert member disposed within said sleeve portion, having a threaded hole for engaging the disassembly tool, and a locking member adapted for engaging a stub shaft.

6,014,909

ROBOT WRIST

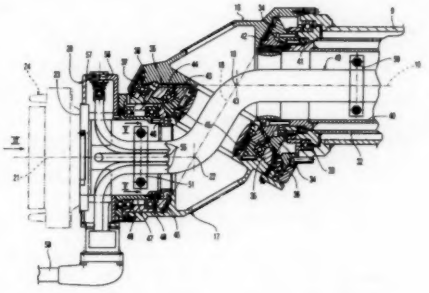
Aldo Fiora, Piossasco, Italy, assignor to Comau S.p.A., Turin, Italy

Filed Apr. 22, 1998, Appl. No. 64,051

Claims priority, application Italy, Apr. 23, 1997, TO97A0349

Int. Cl.[7] **B25J** *17/02;9/12*

U.S. Cl. 74—490.02 **4 Claims**



1. Wrist for an industrial robot comprising:

a first wrist element, carried by a robot arm rotatable around a first axis with respect to a structure supporting said robot arm,

a second wrist element, rotatably supported by said first wrist element around a second axis which crosses the first axis at an angle relative thereto,

a third wrist element rotatably supported by said second wrist element around a third axis which is inclined with respect to the second axis and is coplanar with said first and second axes, said third wrist element including a tool coupling flange, and

electric and fluid supply lines extending through said robot arm and said wrist elements.

wherein said arm is hollow and said second and third wrist elements are connected in rotation with two tubular shafts arranged concentrically inside said robot arm,

the ends of said arm and said tubular shafts opposite to the robot wrist being connected to respective motors for driving rotation of said arm and said second and third wrist elements,

said wrist elements and said concentrical tubular shafts leaving a space inside thereof free for passage of said electric and fluid supply lines for the tool which is to be coupled to the robot wrist,

wherein said third wrist element has a standardized front flange for coupling the tool and comprises a peripheral wall provided with a plurality of radial outlets connected to said supply lines.

6,014,910

PROTECTIVE CAP-SYSTEM FOR BICYCLE CABLE

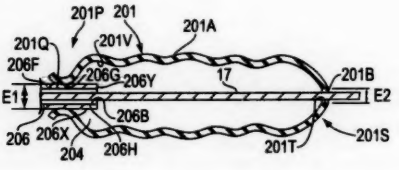
Hiromi Oda, Wakayama; Shinpei Okajima, Izumi, and Masanori Sugimoto, Osakasayama, all of Japan, assignors to Shimano, Inc., Osaka, Japan

Division of application No. 08/600,745, Feb. 13, 1996, Pat. No. 5,809,840, which is a continuation-in-part of application No. 08/502,938, Jul. 17, 1995, abandoned. This application Aug. 7, 1997, Appl. No. 908,727.

Claims priority, application Japan, Feb. 14, 1995, 7-47910; Feb. 24, 1995, 7-59989; Jul. 6, 1995, 7-162779

Int. Cl.[7] **F16C** *1/10*

U.S. Cl. 74—502.6 **11 Claims**



1. An apparatus for preventing contamination of a bicycle control cable having an inner cable (**17**), the apparatus comprising:

a tubular member (**18**,**206**) for receiving the inner cable (**17**) therethrough, the tubular member (**18**,**206**) having an outer circumferential side surface (**18***b*,**206***x*) and a free end face (**18***y*,**206***y*);

a flexible protective cover (**201**) including:

a first end (**201***p*) defining a first opening (**201***q*) having a first opening diameter (E1), wherein the first end (**201***p*) is sealingly disposed over the tubular member (**18**,**206**) by contacting the tubular member (**18**,**206**);

a second end (**201***s*) defining a second opening (**201***t*) having a second opening diameter (E2); and

a side wall (**201***v*) defining a space, wherein the outer circumferential side surface (**18***b*,**206***x*) and the free end face (**18***y*,**206***y*) of the tubular member (**18**,**206**) projects into the space so that the space is disposed around the outer circumferential side surface (**18***b*,**206***x*) of the tubular member (**18**,**206**) between the outer circumferential side surface (**18***b*,**206***x*) of the tubular member (**18**,**206**) and the side wall (**201***v*); and

wherein the outer circumferential side surface (**18***b*,**206***x*) of the tubular member (**18**,**206**) has a constant diameter from a first portion (**18***f*,**206***f*) before contact with the first end (**201***p*) of the protective cover, through a second portion (**18***g*,**206***g*) in contact with the protective cover (**201**), and through a third portion (**18***h*,**206***h*) extending from the second portion (**18***g*,**206***g*) to the free end face (**18***y*,**206***y*), wherein the second portion (**18***g*,**206***g*) is disposed between the first portion (**18***f*,**206***f*) and the third portion (**18***h*,**206***h*).

6,014,911

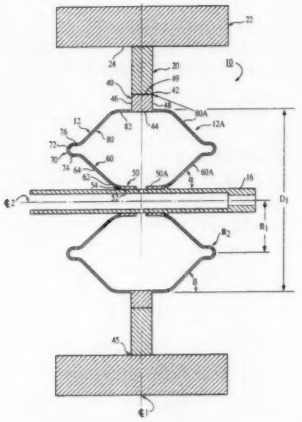
FLYWHEEL WITH SELF-EXPANDING HUB

Dwight W. Swett, 5342 W. 23rd St., Hawthorne, Calif. 90250

Filed Jan. 13, 1998, Appl. No. 6,475

Int. Cl.[7] **F16F** *15/30*

U.S. Cl. 74—572 **13 Claims**



12. A low-weight, high energy storage flywheel coupled to a shaft for rotation about the axis of the shaft comprising:

(a) an annular rotor of a composite material having outer and inner generally surfaces;

(b) an interface disk of a composite material being generally annular and disposed about said shaft and having an outer surface bonded to the inner surface of said rotor and having an inner, generally cylindrical surface;

(c) an expansion hub having oppositely disposed hub shell sections with respect to a vertical center line extending generally perpendicular to the shaft axis, each hub shell section having a coupling means engaging the shaft and having an outer generally conical surface extending to a hinge concentric about said axis and an inner conical wall extending from said hinge to said coupling means; and

(d) said hub shell sections having an outer generally cylindrical surface secured to the inner surface of said interface disk whereby upon rotation, the hub sections flex at said hinge to flatten independently to expand to apply a compression force at the disk resulting in a substantially stress-free condition.

6,014,912

FLYWHEEL ARRANGEMENT WITH AN ADDED MASS

Cora Carlson, Dittelbrunn, Germany, assignor to Mannesmann Sachs AG, Schweinfurt, Germany

Filed Mar. 16, 1998, Appl. No. 39,834

Claims priority, application Germany, Mar. 15, 1997, 197 10 918

Int. Cl.[7] **F16F** *15/30*

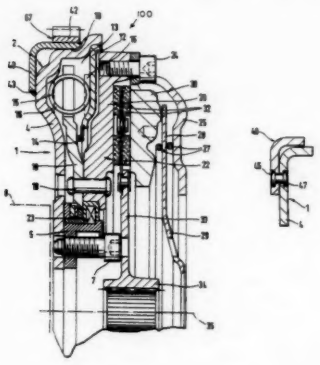
U.S. Cl. 74—574 **7 Claims**

1. A flywheel apparatus for a drivetrain of a motor vehicle, comprising:

a drive-side transmission element rotatably mountable on a rotating axis of the drivetrain;

a driven-side transmission element which is rotatable relative to the drive-side transmission element;

at least one annular added mass having an angular cross section around a majority of its circumference fastened to at least one of the drive-side transmission element and the driven-side transmission element, wherein said added mass comprises a blank produced from strip material having longitudinal ends and shaped in its longitudinal direction to form a ring so that the longitudinal ends of the blank are directed toward one



another with a predetermined intermediate gap, the blank comprising interruptions at predetermined intervals in its longitudinal direction forming tongues between every two of the interruptions, at least part of a length of each of said tongues is subjected to a bending process relative to the remainder of the blank for producing said angular cross section; and

retaining means for fixing the position of the ring.

6,014,913

HOLLOW CRANK SPINDLE UNIT FOR BICYCLES

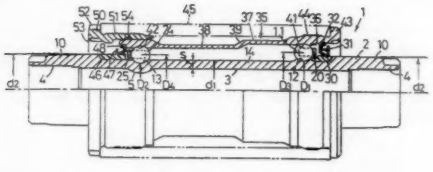
Yamanaka Masahiro, Izumisano, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Dec. 19, 1997, Appl. No. 994,504

Claims priority, application Japan, Dec. 27, 1996, 8-358087

Int. Cl.[7] F16C *19/08*

U.S. Cl. 74—594.1 **18 Claims**



1. A hollow crank spindle unit for bicycles comprising:

a crank spindle having an outer peripheral surface defining a first end, a second end and a hollow central portion;

a plurality of first serrations formed on an outer peripheral surface of the first end of the crank spindle for meshing with serrations formed on a first crank arm;

a plurality of second serrations formed on an outer peripheral surface of the second end of the crank spindle for meshing with serrations formed on a second crank arm;

a first guide surface having a first guide surface diameter formed on the outer peripheral surface of the first end of the crank spindle continuously with and inwardly from the plurality of first serrations;

a second guide surface having a second guide surface diameter formed on the outer peripheral surface of the second end of the crank spindle continuously with and inwardly from the plurality of second serrations;

a first track groove formed on the outer peripheral surface of the first end of the crank spindle, wherein a lowermost surface of the first track groove has a first track groove diameter;

a second track groove formed on the outer peripheral surface of the second end of the crank spindle, wherein a lowermost surface of the second track groove has a second track groove diameter;

wherein the hollow central portion extends beneath the second track groove;

wherein the second track groove has a projection that extends into the hollow central portion;

wherein the hollow central portion extends beneath the first track groove such that an inner peripheral surface of the crank spindle has a constant diameter along an axis of rotation of the crank spindle across an entire width of the first track groove; and

wherein a diameter of the central portion between the first track groove and the second track groove is less than the first guide surface diameter and the second guide surface diameter.

6,014,914

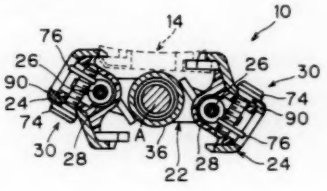
BICYCLE PEDAL

Yutaka Ueda, Tondabayashi, Japan, assignor to Shimano Inc., Osaka, Japan

Filed Nov. 5, 1998, Appl. No. 186,144

Int. Cl.[7] B62M *3/08*

U.S. Cl. 74—594.6 **21 Claims**



1. A bicycle pedal assembly for attaching a shoe thereto via a cleat, comprising:

a pedal shaft having a first end for attachment to a bicycle crank and a second end for supporting a cyclist's foot;

a pedal body rotatably coupled to said second end of said pedal shaft, said pedal body having a first end and a second end;

a first clamping member pivotally coupled to said first end of said pedal body between a clamping position and a releasing position, said first clamping member having a first cleat engagement surface;

a first biasing member coupled between said pedal body and said first clamping member;

a first cover coupled to said first clamping member to substantially enclose said first biasing member between said first clamping member and said first cover, said first cover and said first clamping member being movable together between said clamping position and said releasing position and at least substantially fixed relative to each other, said first clamping member being directly pivotally mounted to said pedal body; and

a second clamping member coupled to said second end of said pedal body, said second clamping member having a second cleat engagement surface.

6,014,915

GEAR HOUSING

Dale M Evans, Windsor, Wis., assignor to Precision Products Systems, LLC, Madison, Wis.

Filed Jun. 11, 1998, Appl. No. 95,736

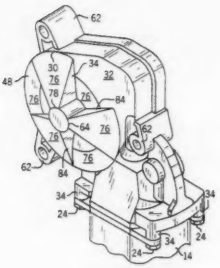
Int. Cl.[7] F16H *57/02*

U.S. Cl. 74—606 R **14 Claims**

12. A gear housing backwall forming part of a gear housing, said backwall comprising:

a central portion having a central axis intersecting a plane orthogonal to said central axis; and

a plurality of segments surrounding said central portion, each of said segments having a narrow end, a wide end, and sides, wherein said narrow end of alternating segments form an integral part of said central portion above said plane and said narrow end of the remaining alternating segments form an



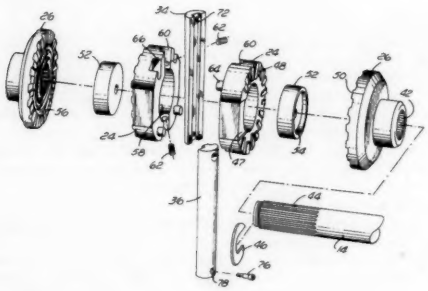
integral part of said central portion below said plane, wherein said wide end of said plurality of segments converge on said plane.

6,014,916

TWO PART PINION PIN FOR A DIFFERENTIAL ASSEMBLY

Mark V. Tyson, Newport Beach, Calif., assignor to Vehicular Technologies, Inc., Costa Mesa, Calif.

Filed May 5, 1998, Appl. No. 73,114
Int. Cl.[7] F16H *48/12*
U.S. Cl. 74—650 **22 Claims**



1. A differential assembly, comprising:
a case that has an inner cavity;
an outer ring gear attached to said case;
a coupler member located within said inner cavity of said case;
a drive member that is coupled to said coupler member; and, a two part pinion pin;
said two part pinion pin beina split along its lenath into a first part and a second part;
said two part pinion pin coupling said drive member to said case.

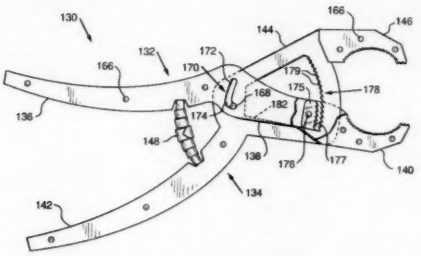
6,014,917

SELF-ADJUSTING AND/OR SELF-LOCKING PLIERS

Alexander Bally, Pittsburgh, and Eric R. Colburn, Wexford, both of Pa., assignors to B!G Ventures, L.L.C., Pittsburgh, Pa.

Filed Jul. 1, 1998, Appl. No. 108,561
Int. Cl.[7] B25B *7/12*
U.S. Cl. 81—355 **14 Claims**

1. Self-adjusting pliers for grasping a workpiece comprising:
first and second plier members each including a handle portion, a jaw portion, and an intermediate portion therebetween;
a first pivot on said intermediate portions permiting said jaw portions to converge on the workpiece and grasp the workpiece in response to initial pivotal movement of said handle portions toward each other;



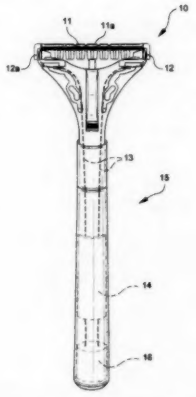
said first pivot includes a first pivot pin attached to said intermediate portion of said second plier member and a positionig slot formed in said intermediate portion of said first plier mnember, said positioning slot having a generally arcuate portion and a shifting slot portion in comunication therewith;
said first pivot pin being slidably received in said positioning slot;
said first pivot pin is positioned in said shifting slot portion of said positioning slot during the initial pivotal movement of said handle portions toward each other to grasp the workpiece;
a second pivot on said intermediate portions permitting a further grasping force to be applied to the workpiece in response to continued pivotal movement of said handle portions toward each other;
said second pivot being closer to said jaw portions than said first pivot; and
biasing means structured (a) for acting in cooperation with said first pivot to maintain said first pivot pin positioned in said shifting slot during the initial pivotal movement of said handle portions and (b) for biasing said handle portions away from each other and said jaw portions away from each other.

6,014,918

TRANSCUTANEOUS ELECTRIC NERVE STIMULATOR RAZOR SYSTEM

Glennis J. Orloff, Woodbridge, Conn., assignor to Warner & Lambert Company, Morris Plains, N.J.

Filed Oct. 28, 1998, Appl. No. 181,422
Int. Cl.[7] B26B *19/38*
U.S. Cl. 83—13 **44 Claims**



43. A method of shaving that reduces pain and discomfort during shaving comprising the steps of: providing a razor system comprising a razor head and a handle, wherein the razor head contains one

or more electrodes which are in a skin-engaging position and the handle contains a signal generation circuit, a power source and a means of transmitting an electrical impulse from the power source to the signal generation circuit and from the signal generation circuit to the razor head to provide a transcutaneous electric nerve stimulation; and removing hair by movably engaging the razor head with the skin.

6,014,919

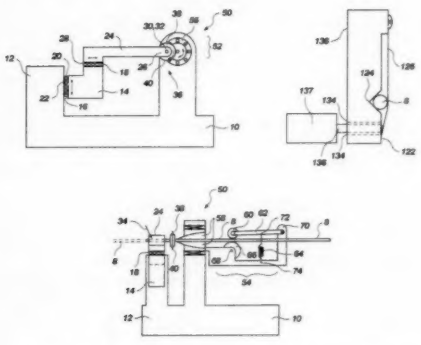
METHOD AND APPARATUS FOR FORMING CUTS IN CATHETERS, GUIDEWIRES, AND THE LIKE

Stephen C. Jacobsen, and Clark Davis, both of Salt Lake City, Utah, assignors to Precision Vascular Systems, Inc., Salt Lake City, Utah

Filed Sep. 16, 1996, Appl. No. 714,555

Int. Cl.[7] B26D *5/02;5/20;7/02*

U.S. Cl. 83—282 **5 Claims**



1. A system for forming precision cuts in a catheter, said system comprising:

a base member;

a vertically movable member slidably coupled to the base member;

a horizontally moveable member having a spindle end and being slidably coupled to the vertically movable member;

at least one rotatable spindle disposed through the spindle end;

a plurality of circular saw blades, wherein the saw blades are mounted in parallel and coaxially on the at least one spindle, and wherein each of the plurality of circular saw blades has a same diameter;

a drive means coupled to the at least one spindle for rotating the at least one circular saw blade;

a clamping member coupled to the base member;

a clamping device disposed within the clamping member to thereby engage the catheter while the at least one circular saw blade makes an incision there through; and further comprising:

a clamping surface wherein a depression is disposed there across for partially receiving and holding straight the catheter;

a plurality of slots extending from the clamping surface through to an oppositely facing back side;

a leaf spring coupled to the clamping surface for forcing the catheter into the depression and against the clamping surface;

a plurality of access holes in between the plurality of slots and extending from the back side through to the clamping surface and;

a plurality of push rods, where in each one of the plurality of push rods is disposed within each of the plurality of access holes to thereby lift the leaf spring from off the catheter when the catheter must be manipulated; and

means for feeding the catheter to the clamping device.

6,014,920

PAPER-PUNCHING DEVICE FOR USE IN A IMAGE-FORMING APPARATUS

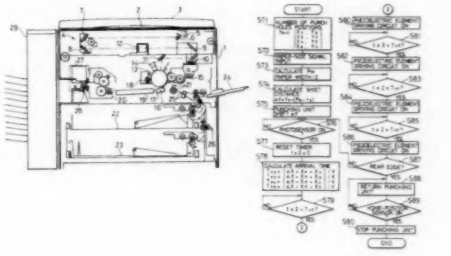
Yasuji Yamauchi, Nara; Toshio Yamanaka, Yao; Masafumi Okumura, Yamatokoriyama; Masashi Hirai, Ikoma; Kyousuke Taka, Nara; Kinji Uno, Yamatokoriyama; Yoshiharu Yoneda, Osaka, and Hirokazu Yamauchi, Uji, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of application No. 08/768,865, Dec. 17, 1996, Pat. No. 5,839,336, which is a continuation of application No. 08/357,217, Dec. 13, 1994, abandoned. This application Sep. 16, 1998, Appl. No. 158,019.

Claims priority, application Japan, Dec. 28, 1993, 5-337329; Mar. 29, 1994, 6-059304

Int. Cl.[7] G03B *27/00;* **B26D** *7/00;5/20*

U.S. Cl. 83—560 **12 Claims**



1. A paper-punching device for use in an image-forming apparatus comprising:

guiding means for guiding a sheet of paper along a paper transport path in a predetermined transporting direction;

transporting means for transporting a sheet of paper along the guiding means at a transport speed;

punching means having a punching blade for forming a punch hole in a sheet of paper while said sheet of paper is being transported by the transporting means, the punching means being situated in the guiding means; and

punching device shifting means for automatically shifting the punching means to one or more hole-punching positions with respect to said sheet of paper while said sheet of paper is being transported said shifting means moving the punching means at a predetermined angle in a direction transverse with respect to the transporting direction and at a shifting speed that is a function of both said predetermined angle and said transport speed.

6,014,921

PRINTING DEVICE WITH AN AUTOMATIC CUTTING MECHANISM

Clive Graham Angel, Hertfordshire; Clive Lawrence Ayling, Hauxton, and Graham Scott Gutsell, Harston, all of United Kingdom, assignors to Esselte N.V., Sint-Niklaas, Belgium

Filed May 13, 1997, Appl. No. 855,417

Claims priority, application United Kingdom, May 14, 1996, 9610028; Jul. 5, 1996, 9614112; Jul. 5, 1996, 9614146

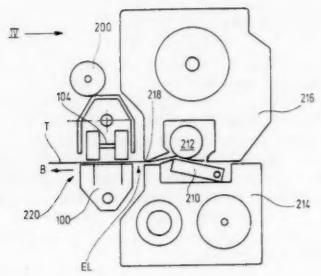
Int. Cl.[7] B26D *11/00*

U.S. Cl. 83—862 **12 Claims**

1. A cutting mechanism comprising:

first and second cutters having first and second opposing blade and anvil components, respectively,

wherein the first anvil component is in the form of a first roller mounted for rolling along the first blade component for progressively biasing and cutting a tape material to a first depth with the first blade component, and the first anvil and first blade components define a first space therebetween that is alterable for disengaging and preventing cutting operation of the first cutter,



wherein the second anvil component is in the form of a second roller mounted for rolling along the second blade component for progressively biasing and cutting the tape material to a second depth with the second blade component;

a carriage, wherein the first and second rollers are rotatably mounted to the carriage and the carriage is movable such that as the carriage moves, the rolling of the first and second rollers occurs;

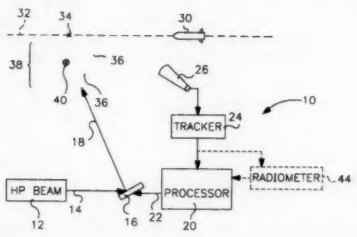
a key having a first cam surface and an actuator having a first end, the first cutter having a cam engaging portion; and

a first-end engaging-portion associated with the carriage for movement therewith, wherein when the carriage moves in a first direction past a first preselected position, the first-end engaging-portion abuts the first end of the actuator and causes the first cam surface to engage the cam engaging-portion for increasing the first space.

6,014,922
SHORT RANGE/INTERMEDIATE RANGE LASER DEFENSE AGAINST CHEMICAL AND BIOLOGICAL WEAPONS

Peter M. Livingston, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 11, 1997, Appl. No. 989,188
Int. Cl.[7] B64D *1/04;* F41G *1/32*
U.S. Cl. 89—1.11 **14 Claims**



1. A method for deactivating a plurality of submunitions released at an altitude to disperse the submunitions, comprising the steps of:

tracking a carrier vehicle of the submunitions to where the carrier vehicle releases the submunitions in a dispersion pattern;

locating an approximate centroid of the dispersion pattern;

directing a laser beam toward the centroid of the dispersion pattern;

displacing the laser beam in a generally outward spiral from the centroid of the dispersion pattern, the laser beam detecting a submunition encountered during the spiral displacement;

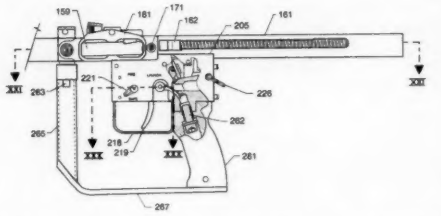
deactivating the detected submunition; and

continuing to displace the laser beam in the spiral pattern after deactivating the submunition, the laser beam detecting and deactivating additional submunitions of the plurality of munitions.

6,014,923
SHOULDER-FIRED MULTI-PURPOSE ASSAULT WEAPON

Michael M. Canaday, King George, and Fred W. Watson, Jr., Montross, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of application No. 08/667,170, Jun. 20, 1996, Pat. No. 5,854,440, which is a continuation-in-part of application No. 08/514,575, Oct. 30, 1995, Pat. No. 5,712,443. This application Nov. 25, 1997, Appl. No. 978,165.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] F41F *3/04;* F41A *19/00*
U.S. Cl. 89—127 **34 Claims**



1. A shoulder-launched multi-purpose assault weapon comprising:

a receiver for a spotting rifle adapted to serve as a mounting base;

a trigger housing attached to said receiver;

a trigger housing frame adapted for attachment to the spotting rifle;

a trigger rotatably mounted within said housing;

a connector link pivotally mounted to said trigger, said trigger having a first lug at a first end for engagement of a primary sear and a second lug at a second end for engagement of a secondary sear;

a selector lever rotatably mounted on said housing frame and engaging said connector link with an eccentric cam section thereby providing a position control of said connector link;

a primary sear pivotally attached to said trigger housing frame and engaging said connector link;

a primary hammer rotatably connected to said trigger housing frame and engaging said primary sear;

a primary hammer spring connected to said hammer on a first end and having a second end for connection to a connector link spring lever;

a connector link spring lever engaging and operated by said primary hammer spring and further engaging said connector link thereby providing a downward impetus to the second end of said connector link and urging said link against the selector lever;

a secondary sear prop rotatably attached to said trigger housing frame and engaging the second end of said connector link;

a secondary sear rotatably mounted in the stock attached to and engaging said sear prop;

a secondary hammer slideably mounted to the trigger housing and engaging said secondary sear;

a barrel retaining pin attached to said receiver and a center ring bracket and further securing said spotting rifle barrel to said receiver;

a muzzle clamp ring bracket assembly for attaching the muzzle of the spotting rifle barrel to a rocket launcher tube;

a hollow cylindrical bolt lockback inserted through said trigger housing and having an upper slot and a lower slot and having beveled shoulders on a bolt-engaging end;

an operating spring inserted inside said hollow cylindrical bolt lockback;

a cartridge ejector having a slot and being inserted into said hollow cylindrical bolt lockback and thereby compressing said operating spring;

a retainer spring inserted through the slots of both said bolt lockback and said cartridge ejector;

a bolt housing attached to said fixed receiver having a cylindrical shape;

a first spring contained within said bolt housing;

a two-part bolt assembly having an outer cylindrical bolt slideably positioned within said bolt housing and operated by said first spring and having an inner bolt and pin mechanism slideably positioned within said outer cylindrical bolt; and

a second spring positioned within said outer cylindrical bolt and enclosing said inner bolt and pin assembly and further urging said inner bolt and pin assembly toward the firing position.

6,014,924

SLIDE DRIVE ARRANGEMENT

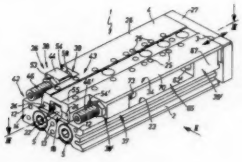
Kurt Stoll, Esslingen; Uwe Mödinger, Wernau, and Dieter Waldmann, Ebersbach, all of Germany, assignors to Festo AG & Co., Esslingen, Germany

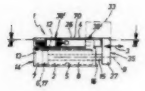
Filed Mar. 17, 1998, Appl. No. 40,358

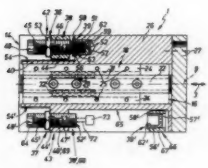
Claims priority, application Germany, Apr. 5, 1997, 297 06 098 U

Int. Cl.[7] F01B *31/14*

U.S. Cl. 92—13.5 **14 Claims**







1. A slide drive device comprising:

a principal housing having a front end region and a rear end region;

at least one linearly driven actuating element provided within the housing;

a slide arranged externally on the housing and kinetically coupled with the at least one actuating element, said slide having a front end region and a rear end region and linearly moveable between a first end position and a second end position;

a guide means positioned between the housing and the slide, said guide means guiding the slide between the first end position and the second end position; and

a stroke limiting means acting between the principal housing and the slide for variably presetting the first end position and the second end position of the slide, said limiting means including;

a first adjustable abutment arranged on one of the front end region and rear end region of the slide and set in the direction of motion of the slide;

a first counter-abutment arranged on the housing and opposing the first adjustable abutment;

a second adjustable abutment arranged on one of the front end region and rear end region of the housing and set in the direction of motion of the slide;

a second counter-abutment arranged on the slide and opposing the second adjustable abutment; said first adjustable abutment and second adjustable abutment facing in the same axial direction.

6,014,925

TOASTER AND PROCESS FOR MOUNTING ELECTROMAGNETIC ACTUATOR THEREIN

Sanjuan Antonio Basora, and Julian Arnedo, both of Barcelona, Spain, assignors to Moulinex S.A., Paris, France

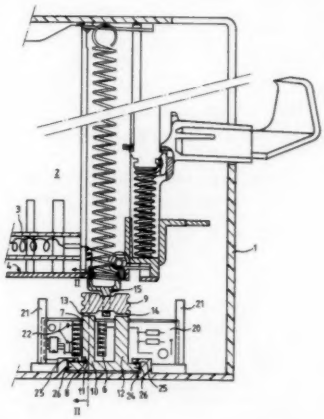
PCT No. PCT/FR96/01646, § 371 Date Apr. 27, 1998, § 102(e) Date Apr. 27, 1998, PCT Pub. No. WO97/15220, PCT Pub. Date May 1, 1997

PCT Filed Oct. 21, 1996, Appl. No. 65,033

Claims priority, application France, Oct. 26, 1995, 95 12666

Int. Cl.[7] A47J *37/08*

U.S. Cl. 99—327 **12 Claims**



1. Electric toaster comprising a housing enclosing a toasting chamber provided with at least one heating resistance and in which is movably mounted a bread carrier between at least one ejection position and a toasting position in which the bread carrier is retained by an electromagnetic actuating device comprising a control winding with a hollow support which is secured to a plate mounted fixedly in the housing and carrying at least electrical connection elements, said hollow support surrounding a magnetic core, and a movable armature adapted to retain the bread carrier in its toasting position when the winding is supplied, and wherein

the magnetic core is mounted mechanically independently of the support of the winding and of the plate, and is secured to a member on the housing.

6,014,926

INJECTION INTO MEAT AND PICKLE INJECTOR FOR USE THEREIN

Yoshihiko Tanaka; Takashi Tsuzuku; Takayuki Takahashi, and Akihiro Suzuki, all of Tsuchiura, Japan, assignors to Prima Meat Packers, Ltd., Japan

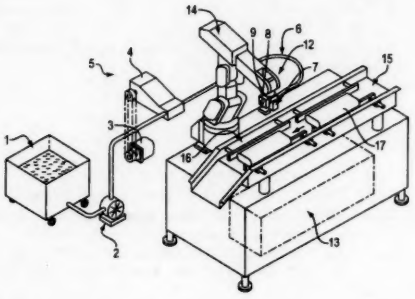
Filed May 13, 1998, Appl. No. 76,729

Claims priority, application Japan, May 13, 1997, 9-121924; Jun. 19, 1997, 9-162964; Sep. 18, 1997, 9-253678

Int. Cl.[7] A22C *17/00;* **A23L** *1/31*

U.S. Cl. 99—487 **11 Claims**

1. A pickle injector being a device for injecting a liquid substance to a green meat which comprises a high-pressure liquid generator; an injecting section of the liquid substance; and a pressure controller which can control an injection pressure while



injecting the liquid substance when the liquid substance is injected from the injecting section to the green meat.

6,014,927

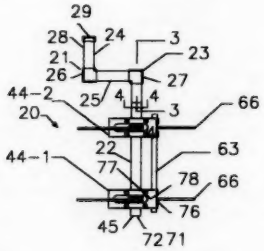
PRUNING BALER

Michael H. Hilford, 511 Kings Row, Newport Beach, Calif. 92663

Filed Feb. 21, 1998, Appl. No. 27,505

Int. Cl.[7] B30B *5/04;* **B65B** *13/20*

U.S. Cl. 100—212 **20 Claims**



1. A device for compressing a stack of prunings from trees or shrubs into a generally cylindrically-shaped bundle suitable for transporting and disposal comprising;

a. a winch shaft,

b. at least a first support means including a base plate having bearing means for rotatably supporting said winch shaft, said base plate having through its thickness dimension an aperture disposed radially rearwards from said winch shaft for receiving therethrough a tensioning cable,

c. means for rotating said winch shaft,

d. at least a first elongated flexible tensioning cable adapted for attachment at a first end thereof to said winch shaft, and for being wound around said shaft when said shaft is rotated,

e. anchor means at a second end of said tensioning cable, and

f. hook means fixed to said support means for releasably engaging and restraining said anchor means against motion in response to tension exerted by said tensioning cable upon rotation of said winch shaft, whereby said support means may be placed in contact with a stack of prunings, said tensioning cable looped around said stack, said anchor means engaged by said hook means, and said winch shaft rotated by said rotating means to thereby increase tension in said tensioning cable and thereby radially compress said stack.

6,014,928

SCREEN PRODUCT HAVING AN ENHANCED RADIATION-ABSORBING CAPACITY, IN PARTICULAR SUITABLE FOR USE IN FLAT OR ROTARY SCREEN PRINTING, AS WELL AS METHOD FOR MANUFACTURING THEREOF

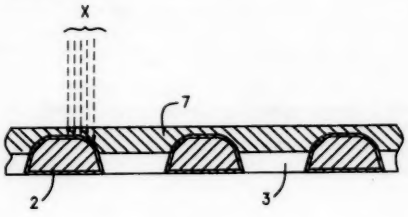
Petrus H. M. Delmee, Rosmalen, Netherlands, assignor to Stork Screen B.V., Netherlands

Continuation-in-part of application No. PCT/NL96/00288, Jul. 16, 1996. This application Jan. 16, 1998, Appl. No. 8,158.

Claims priority, application Netherlands, Jul. 17, 1995, 1000825

Int. Cl.[7] B05C *17/06*

U.S. Cl. 101—128.21 **13 Claims**



1. Screen product for use in flat screen or rotary screen printing, comprising an electroformed, essentially nickel-containing metal body which determines two essentially parallel faces, and which is provided with a plurality of openings, each opening extending from one of the two faces to the other, and each opening having a side wall in common with the metal, wherein the screen product comprises at least a radiation-absorbing, non-photosensitive part on at least one of the two faces of the screen product or the side walls of the openings.

6,014,929

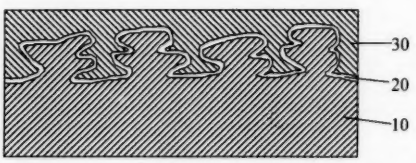
LITHOGRAPHIC PRINTING PLATES HAVING A THIN RELEASABLE INTERLAYER OVERLYING A ROUGH SUBSTRATE

Gary Ganghui Teng, 10 Kendall Dr., Nothborough, Mass. 01532

Filed Mar. 9, 1998, Appl. No. 36,881

Int. Cl.[7] B41N *1/08;* **G03F** *7/11*

U.S. Cl. 101—456 **38 Claims**



1. A lithographic printing plate comprising:

(a) a substrate with rough and/or porous surface on at least one side, said rough and/or porous surface comprising a microscopic structure selected from the group consisting of irregular peaks, valleys, holes, and pores that are capable of mechanical interlocking with a coating deposited thereon;

(b) a releasable interlayer deposited on the rough and/or porous surface of said substrate, said releasable interlayer being soluble or dispersible in a liquid selected from the group consisting of water, fountain solution, ink, aqueous and solvent plate developers, organic solvents, and press cleaners; wherein said releasable interlayer is substantially conformally coated on the microscopic structures of the substrate surface and is thin enough in thickness so that, the releasable inter-

layer coated substrate has microscopic surface profiles similar to those of the substrate, and a coating on the releasable interlayer is capable of bonding to the substrate through mechanical interlocking and is incapable of being removed without deforming or breaking the coating or the substrate surface structures even if the releasable interlayer is dissolved away; and

(c) a radiation-sensitive layer on the releasable interlayer, said radiation-sensitive layer exhibiting an affinity or aversion substantially opposite to the affinity or aversion of said substrate to at least one printing liquid selected from the group consisting of ink and an abhesive fluid for ink.

6,014,930

SINGLE LAYER DIRECT WRITE LITHOGRAPHIC PRINTING PLATES

Mitchell S. Burberry, Webster; Charles D. DeBoer, Palmyra, and Mark A. Harris, Rochester, all of N.Y., assignors to Kodak Polychrome Graphics LLC, Norwalk, Conn.

Continuation-in-part of application No. 08/900,743, Jul. 25, 1997, abandoned. This application Jun. 11, 1998, Appl. No. 95,812.

Int. Cl.[7] **G03F** *7/038*

U.S. Cl. 101—456 **21 Claims**

1. A lithographic printing plate precursor element comprising:

(A) a support web coated with

(B) a coextensive hydrophilic layer comprising an outer hydrophilic surface and having a layer thickness, said layer comprising

(1) a crosslinked polymeric matrix consisting essentially of a matrix derived from a crosslinker selected from the group consisting of dialkoxysilanes, trialkoxysilanes, tetraalkoxysilanes;

(2) a colloid of silica, the amount of silica in the layer being from 500% to 1500% of the crosslinker; and

(3) a photothermal conversion material comprising a radiation absorber, said material being capable of accepting ink upon exposure to high intensity radiation.

6,014,931

IMAGING A LITHOGRAPHIC PRINTING PLATE

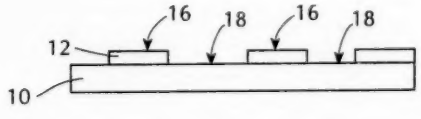
Howard A. Fromson, 49 Main St., Stonington, Conn. 06378; Robert F. Gracia, Woodstock Valley, Conn., and Steven A. Rubin, Glastonbury, Conn., assignors to Howard A. Fromson, Rockville, Conn.

Division of application No. 08/928,202, Sep. 12, 1997, which is a continuation of application No. 08/567,690, Dec. 5, 1995, Pat. No. 5,750,314. This application Sep. 2, 1998, Appl. No. 145,404.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B41C** *1/10;* **B05D** *5/04*

U.S. Cl. 101—465 **27 Claims**



1. Method for selectively imaging a planographic substrate, said method consisting essentially of the following serial steps:

(i) coating one surface of a substrate with a first material which is soluble in a first solvent without being exposed to actinic light, (ii) selectively applying a second material in a desired image array on said coating of said first material on said substrate, thereby producing imaged areas and non-imaged areas, said second material adhering to said first material on said imaged areas and being insoluble in said first solvent without being exposed to actinic light, and

(iii) dissolving the first material on said non-imaged areas in said first solvent, thereby removing said first material to expose said surface of said substrate in said non-imaged areas.

6,014,932

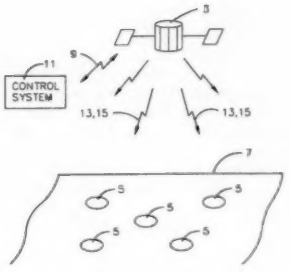
LAND MINE ARMING/DISARMING SYSTEM

Aris Mardirossian, Germantown, Md., assignor to Technology Patents, LLC, Derwood, Md.

Filed Nov. 18, 1997, Appl. No. 972,394

Int. Cl.[7] **F42C** *7/00;* **F42B** *22/00;* **B64D** *1/04;* **G01S** *13/00*

U.S. Cl. 102—200 **5 Claims**



1. A method of disarming a land mine, the method comprising the steps of:

providing a land mine in the earth;

providing a central control system and at least one satellite;

the central control system sending an instructional signal to the satellite;

the satellite, in response to receiving the instructional signal, transmitting a disarming signal to the land mine through atmospheric free space in order to disarm the mine;

the land mine receiving the disarming signal from the satellite and automatically disarming itself so that the mine cannot be detonated if stepped;

the land mine transmitting a confirmation signal to the satellite in response to receiving the disarming signal so as to indicate via the satellite that the disarming signal has been received; and

the land mine on a substantially continuous or periodic basis transmitting status signals through atmospheric free space to the satellite in order to indicate via the satellite the status of the land mine.

6,014,933

DOWNHOLE CHARGE CARRIER

Donald V. Umphries, New Iberia, La.; Harold D. Owen; Bobby R. Ford, both of Fort Worth, Tex., and David S. Wesson, Desoto, Tex., assignors to Weatherford US Holding, L.P. a Louisiana Limited Partnership, and Owen Oil Tools, Inc.

Continuation of application No. 08/108,903, Aug. 18, 1993. This application Oct. 2, 1997, Appl. No. 942,631.

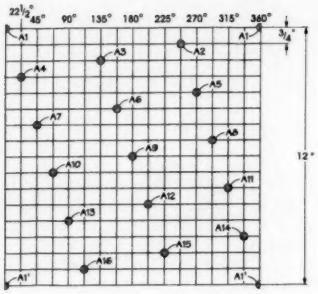
Int. Cl.[7] **F42B** *3/00;* **E21B** *7/00*

U.S. Cl. 102—312 **17 Claims**

1. A perforating apparatus comprising:

a substantially cylindrical carrier having a longitudinal axis;

a plurality of explosive charges which are connected successively to said carrier and which face outwardly from said longitudinal axis, where the axial distance between axially sequential charges is not greater than ¾ inch and where no two of said charges are mounted within a given plane perpendicular to said longitudinal axis; and



a detonator operationally connected to said explosive charges.

6,014,934

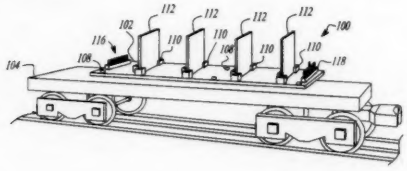
MODULAR MODEL TRAIN CIRCUIT BOARD ARRANGEMENT

Marty Pierson, Howell, Mich., assignor to Lionel, LLC, Chesterfield, Mich.

Filed Nov. 4, 1998, Appl. No. 185,557

Int. Cl.[7] B61D *17/00*

U.S. Cl. 105—26.05 **27 Claims**



24. For use with a model railroad, a model train comprising:

a model railroad car having a platform;

a motherboard, mounted on the platform, the motherboard comprising a plurality of receptacles configured and arranged to accept and communicate signals with a plurality of removable circuit modules inserted therein;

a motor driver arrangement, coupled to the motherboard and configured and arranged to control a motor of the model train;

a light control circuit module, inserted in a first receptacle of the motherboard, responsive to a radio signal, and configured and arranged to control at least one light device in the model train in response to the radio signal; and

a sound control circuit module, inserted in a second receptacle of the motherboard, configured and arranged to detect operating conditions of the model train and to select sound effects to be generated as a function of the detected operating conditions.

6,014,935

ALL WEATHER OUTDOOR TABLE COVER

Timothy Willett, 6862 Lindbergh Ave., Edwards AFB, Calif. 93523

Filed Mar. 9, 1998, Appl. No. 36,982

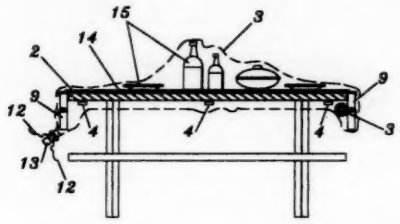
Int. Cl.[7] A47B *13/08*

U.S. Cl. 108—90 **15 Claims**

1. A table cover comprising:

a tablecloth having a plurality of straps attached to an edge of the tablecloth with a strap fastening means attached at an edge opposite each strap;

a protective cover attached at a portion of the protective cover perimeter by a means for attachment to a portion of the tablecloth perimeter;



a hem formed adjacent the perimeter of the protective cover and containing two openings therein; and

a draw cord contained within the hem graspable through the hem openings for drawing the protective cover perimeter under a table top.

6,014,936

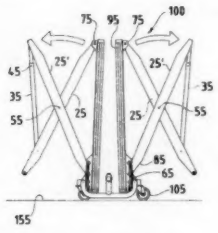
VARIABLE HEIGHT FOLD AND ROLL STAGING AND METHOD OF ASSEMBLING SAME

Orley David Rogers, Farwell, and Kenneth Edward Staten, Clare, both of Mich., assignors to Stageright Corporation, Clare, Mich.

Filed Jul. 27, 1998, Appl. No. 123,178

Int. Cl.[7] A47B *3/00*

U.S. Cl. 108—167 **21 Claims**



1. A variable height staging comprising:

a cross brace member with at least one caster attached thereto;

a slot and groove assembly pivotally attached to the cross brace member, the slot and groove assembly having a plate, the plate comprising a slot with at least one groove defined therein;

at least one platform panel element having a bottom surface, the slot and groove assembly plate connected to the bottom surface of the platform panel element; and

at least two pair of cross legs, each pair having a first cross leg having a support end and a pivot end, the pivot end pivotally connected to the bottom surface of the platform panel element and the second cross leg having a support end and a locking end, the locking end having a cross pin, the cross pin engaged by the slot and groove assembly; the first and second cross legs pivotally connected together.

6,014,937

FINE GAUGE TUFTING MACHINE WITH STAGGERED NEEDLE BAR

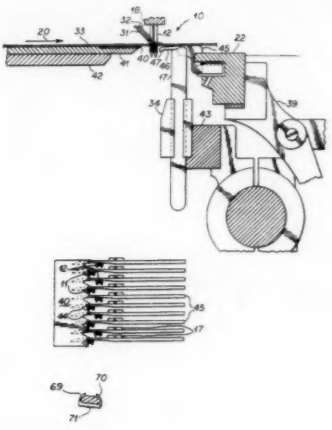
Brian K. Lovelady, Soddy-Daisy, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Continuation-in-part of application No. 08/223,851, Apr. 6, 1994, abandoned. This application Dec. 9, 1997, Appl. No. 987,784.

Int. Cl.[7] D05C *15/30*

U.S. Cl. 112—80.41 **39 Claims**

1. A tufting machine comprising:



a. a mechanism for moving a base fabric longitudinally through said machine in a feeding direction;

b. a single staggered needle bar having both a first row and a second row of needles uniformly spaced transversely of the feeding direction, said second row of needles being longitudinally spaced from said front row of needles by about 0.120 to 0.160 inches, and being uniformly and transversly staggered relative to said first needles, to form a uniform narrow composite gauge;

c. a needle drive for reciprocating said needle bar toward and away from a first side of said base fabric to cyclically penetrate said base fabric;

d. a single row of hollow ground loopers disposed transversly to the feeding direction and adjacent the base fabric on a second side opposite said base fabric from the needle bar, said hollow ground loopers having throats of substantially the same length and being spaced apart transversly by a distance substantially equal to the composite gauge of the first and second rows of needles;

e. a needle bar shifting mechanism operatively connected to said needle bar to transversly shift the needle bar by multiples of the composite gauge of the first and second rows of needles; and

f. a looper drive operatively connected to said row of hollow ground loopers for cyclically reciprocating said hollow ground loopers between an engaged loop seizing position with said first and second rows of needles when said needles have penetrated the base fabric, and an unengaged position when said needles are reciprocated away from the first side of said base fabric.

6,014,938

OVER EDGING APPARATUS FOR SINGLE CLOTH PIECE PRODUCTS

Yoshitsugu Uto, Niwa, Japan, assignor to Barudan Sewing Machine Co., LTD., Aichi, Japan

PCT No. PCT/JP97/01675, § 371 Date Nov. 19, 1998, § 102(e) Date Nov. 19, 1998, PCT Pub. No. WO97/44516, PCT Pub. Date Nov. 27, 1997

PCT Filed May 19, 1997, Appl. No. 180,983

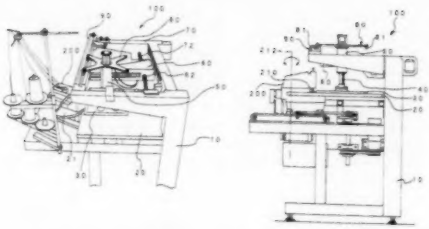
Claims priority, application Japan, May 20, 1996, 8-124305; Mar. 7, 1997, 9-053546; May 15, 1997, 9-125566

Int. Cl.[7] **D05B** *39/00*

U.S. Cl. 112—470.18 **10 Claims**

1. A hemstitching apparatus for single-fabric products, comprising:

a press plate to press a fabric piece on a work table held by a machine frame;



a guide beam provided integrally with said press plate to hold and move a vertically installed shaft in the cross-machine direction;

a drive device to move said beam in the machine direction;

a turn device provided integrally on the upper end of said shaft;

a guide rail mounted on said machine frame to guide a plurality of guide rollers provided on said turn device; and

a sewing device to hem stitch said fabric piece pressed under said press plate,

wherein the reciprocal movement and turning of said press plate pressing said fabric piece and said turn device provided integrally with said press plate are to be provided solely by said guide beam as moved reciprocally by said drive device.

6,014,939

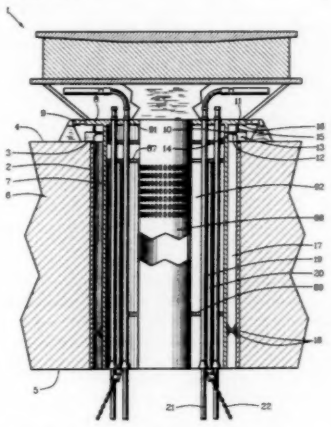
UNIVERSALLY STABLE OIL WELL SHIP TURRET

Val J. Gusmeri; John Moses, both of Houston, Tex., and Roger Burnison, Berkshire, United Kingdom, assignors to Hydralift, Inc., Houston, Tex.

Continuation-in-part of application No. 08/790,926, Jan. 29, 1997, abandoned. This application Sep. 26, 1997, Appl. No. 938,344.

Int. Cl.[7] **B63B** *21/00*

U.S. Cl. 114—230.12 **44 Claims**



1. A universally stable mooring turret comprising:

a circumturret cylinder extended vertically downward from a turret base proximate a main deck of an oil-well ship to a bottom of a well-working portion of the oil-well ship;

a turret cylinder extended rotationally downward inside of the circumturret cylinder and having a turret flange extended radially outward above the turret base;

a turret rotator in rotative communication between the circumturret cylinder and the turret cylinder;

the turret rotator being actuated to rotate the turret cylinder in compensating opposition to directional change of the circumturret cylinder resulting from directional change of the oil-well ship;

a plurality of horizontal bearings which are extended horizontally from horizontal-bearing pressure cylinders that are attached to bearing bases that are affixed circumferentially to the oil-well ship about an outside periphery of the turret base;

a horizontal-bearing race that is oriented vertically on a circumferential portion of the turret flange;

the plurality of horizontal bearings being actuated by the horizontal-bearing pressure cylinders to bear against the horizontal-bearing race selectively in response to a horizontal-pressure controller;

a plurality of vertical bearings that are extended vertically from vertical-bearing pressure cylinders that are attached to bearing bases that are affixed circumferentially to the oil-well ship about the outside periphery of the turret base;

a vertical-bearing race that is oriented horizontally on a bottom circumferential portion of the turret flange;

the plurality of vertical bearings being actuated by the vertical-bearing pressure cylinders to bear against the vertical-bearing race selectively in response to a vertical-pressure controller;

the horizontal-pressure controller and the vertical-pressure controller being coordinated and controlled by a turret position controller positioned in a control position from which control of the mooring turret is communicated on the oil-well ship;

an annular-clearance space intermediate an inside periphery of the circumturret cylinder and an outside periphery of the turret cylinder;

the annular-clearance space being sized and shaped for containing the turret cylinder upright vertically while the circumturret cylinder is being tilted randomly from turning, heaving, yawing and moving of the oil-well ship by wave and weather and conditions;

the turret cylinder inside of the randomly tilting and turning circumturret cylinder being positioned horizontally by the plurality of horizontal bearings and being positioned vertically by the plurality of vertical bearings in coordinated response to the horizontal-pressure controller and the vertical-pressure controller respectively; and

the turret cylinder being rotatable on the plurality of vertical bearings and being rotatable horizontally intermediate contact surfaces of the plurality of horizontal bearings that are oppositely disposed circumferentially with coordinated bearing control being applied in compensating opposition to vertical and horizontal displacement pressures and in compensating opposition to rotational pressures resulting from wave, weather, ocean-current and ship-steering factors in order to maintain operable concentricity of the turret cylinder in relationship to the circumturret cylinder, in order to maintain operably horizontal and orthogonally vertical attitude of turret-based equipment and in order to compensate for side pressures of mooring lines, risers and other operating equipment suspended from the mooring turret.

6,014,940

SURFACE EFFECT CRAFT

Clayton Jacobson, P.O. Box 7836, Incline Village, Nev. 89452

Continuation-in-part of application No. 08/664,407, Jun. 17, 1996, which is a continuation-in-part of application No. 08/200,240, Feb. 22, 1994, Pat. No. 5,526,764, which is a continuation-in-part of application No. 07/540,887, Jun. 20, 1990, Pat. No. 5,357,894, which is a continuation of application No. 07/334,760, Apr. 6, 1989, abandoned, which is a continuation of application No. 06/856,674, Apr. 25, 1986, abandoned. This application May 20, 1998, Appl. No. 82,459.

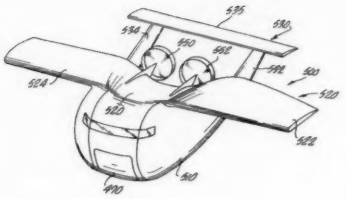
Int. Cl.[7] B63B *1/00*

U.S. Cl. 114—271 **24 Claims**

1. A flying craft having an aerodynamic configuration comprising

a continuous wing-shaped body structure having a central hull section and first and second main wing sections laterally positioned one on either side of the central hull section, the first and second main wing sections merging into the central hull section to form the continuous wing-shaped structure;

a generally U-shaped rear section as viewed from a rear location, the U-shaped rear section being formed by a U-shaped rear portion of the central hull and by opposed first and second vertical stabilizers disposed at an outer periphery of the first and second main wing sections.



6,014,941

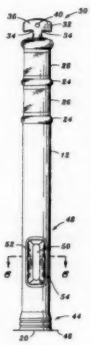
TRAFFIC DELINEATOR

Bruce C. Bent, and James A. Bent, both of Huntington Beach, Calif., assignors to Bent Manufacturing Company, Huntington Beach, Calif.

Filed Feb. 29, 1996, Appl. No. 610,168

Int. Cl.[7] E01F *9/00*

U.S. Cl. 116—63 R **12 Claims**



1. A traffic delineator having a cylinder with a predetermined height and circumference and comprising an upper end, a lower end that flares into an outwardly extending flange, and a handle formed into the cylinder at a predetermined longitudinal position substantially at the center of gravity of the delineator when the delineator includes a base mounted on the outwardly extending flange, the handle comprising opposing angled interior walls that each form a vertex, said walls passing through the cylinder such that the vertex of each wall is generally directed towards the opposing vertex to facilitate gripping by a human hand.

6,014,942

WORKSTATION SIGNAL DEVICE

Alan T. Perka, and Cathy S. Perka, both of 4401 Southfield Ct., Wilmington, N.C. 28405

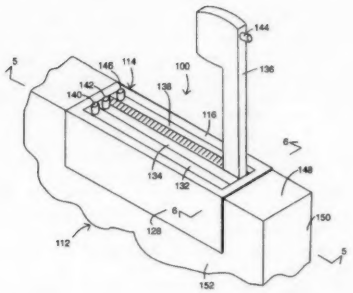
Filed Mar. 28, 1997, Appl. No. 826,023

Int. Cl.[7] G09F *17/00*

U.S. Cl. 116—309 **3 Claims**

1. A workstation comprising:

a) a cubicle wall having an upper horizontal surface, vertical front and back wall segments, and a given thickness, said upper horizontal surface including a signal device receiving recess extending downwardly between said vertical wall segments; and



b) a signal device mounted within said recess to visually indicate the status of a user of said workstation by viewing the top of the cubicle wall, said device including

i) a housing located in said recess, said housing having vertical side walls, and a horizontal pivot pin extending between said side walls adjacent one end of said housing; and

ii) a plurality of flags having inner and outer ends, each of said flags being attached at its inner end to said horizontal pin and being pivotal about its inner end between a generally horizontal lowered position within said housing between said housing side walls and a generally vertical position extending above said cubicle wall upper horizontal surface, said flags being substantially below the upper horizontal surface of said cubicle wall when said flags are in their respective lowered positions.

6,014,943

PLASMA PROCESS DEVICE

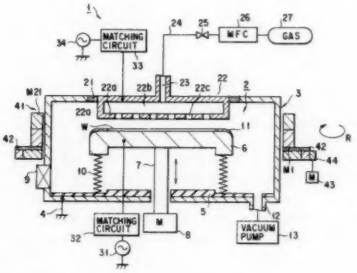
Junichi Arami, Tokyo; Hiroo Ono, Yamanashi-ken; Tomomi Kondo, Kofu, and Koji Miyata, Sabae, all of Japan, assignors to Tokyo Electron Limited, and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Sep. 11, 1997, Appl. No. 928,026

Claims priority, application Japan, Sep. 12, 1996, 8-263699

Int. Cl.[7] C23C *16/00*

U.S. Cl. 118—723 E **12 Claims**



1. A plasma process device comprising:

a process vessel having a plasma generating area therein;

support means provided in the process vessel, for supporting a substrate having a process surface which faces the plasma generating area;

gas introducing means for introducing a process gas into the plasma generating area;

plasma generation means including a dipole ring magnet arranged around the outer periphery of the process vessel for generating a magnetic field having a magnetic line of force in the proximity of the process surface, the plasma generation means generating a plasma of said process gas in the plasma generating area;

said dipole ring magnet arranged along the outer periphery of the process vessel, and having a plurality of anisotropic segment magnets extending perpendicularly to the process surface and an auxiliary magnet provided on at least one end of each of the extending plural anisotropic segment magnets, said auxiliary magnet configured to correct a perpendicular component of a magnetic field of the process vessel.

6,014,944

APPARATUS FOR IMPROVING CRYSTALLINE THIN FILMS WITH A CONTOURED BEAM PULSED LASER

Monti E. Aklufi, and Stephen D. Russell, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1997, Appl. No. 934,037

Int. Cl.[7] C23C *16/48*

U.S. Cl. 118—723 R **9 Claims**

1. A contoured beam annealing apparatus comprising a pulsed optical energy source coupled to beam contouring optics for directing pulsed optical energy onto a surface of a thin film.

6,014,945

CONNECTION DEVICE FOR A MILKING UNIT

Kenneth Gustafson, Södertälje, Sweden, assignor to Alfa Laval Agri AB, Tumba, Sweden

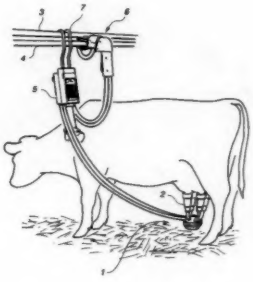
PCT No. PCT/SE95/00577, § 371 Date Nov. 15, 1996, § 102(e) Date Nov. 15, 1996, PCT Pub. No. WO95/32614, PCT Pub. Date Dec. 7, 1995

PCT Filed May 23, 1995, Appl. No. 737,860

Claims priority, application Sweden, May 31, 1994, 9401871

Int. Cl.[7] A01J *7/00*

U.S. Cl. 119—14.01 **17 Claims**



1. A connection device for connection of a milking unit to a milk line in a pipeline milking plant, the milk line having a wall that surrounds a channel and has a hole, and the milking unit having a cavity for extracted milk, comprising:

a valve housing having an opening and being adapted to be fastened to the milk line in such a way that the opening communicates with the channel of the milk line via the hole in the wall of the milk line;

a connection member having a through passage and being adapted to be connected to the milkinig unit in such a way that the passage communicates with said cavity of the milking unit, the connection member further being adapted to be releasably connected to the valve housing in such a way that the passage communicates with the opening of the valve housing;

guiding means adapted during a translational movement of the connection member to positively guide the connection member in relation to the valve housing in a predetermined movement path from a first position to a second position, in which latter position the passage of the connection member commu-

nicates with the channel of the milk line via the opening of the valve housing and the hole in the wall of the milk line;

a sliding valve which is adapted to cover said opening of the valve housing in a closing position, and to uncover this opening in an opening position, such that it communicates with the passage of the connection member; and

a coupling device adapted, during a positively controlled translational movement of the connection member, when the connection member is in an intermediate position between said first and second positions to connect the connection member to the sliding valve in such a way that the sliding valve is positively connected to the connection member, the coupling device further being adapted to release the connection member from the sliding valve in said intermediate position of the connection member, when the connection member is moved in a direction from said second towards said first position.

6,014,946

MULTIPLE USE COMMODE ASSEMBLY

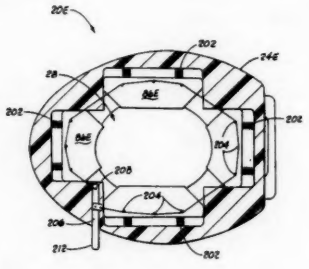
Jon K. Rymer, P.O. Box 888, Norman, Okla. 73070

Continuation of application No. 08/485,115, Jun. 7, 1995, abandoned, and a continuation-in-part of application No. 08/212,204, Mar. 11, 1994, Pat. No. 5,458,089. This application Jul. 28, 1997, Appl. No. 901,809.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A01K *29/00*

U.S. Cl. 119—162 **27 Claims**



1. A toilet seat for use by a human and by a pet animal user, comprising:

a rim member having a central aperture;

shelf means adjustably mounted to the rim member for adjusting the size of the central aperture, the shelf means having a plurality of shelf segments which are positionable in one of a protracted position and a retracted position, the shelf segments reducing the size of the central aperture in the protracted position and the shelf segments leaving the central aperture substantially open when in the retracted position, the shelf segments capable of supporting the weight of a pet animal user when in the protracted position; and

cable means for adjusting the shelf segments between the protracted position and the retracted position, the cable means comprising:

at least one roller assembly attached to the shelf means; and

a cable engaging the roller assembly and having an adjustable tension so that the shelf segments can be changed selectively to be positioned in the protracted position and the retracted position.

6,014,947

GROUND GRAIN ANIMAL LITTER

James H. Sladek, Battle Lake; S. Michael Hughes, Detroit Lakes, both of Minn., and Roy F. House, Houston, Tex., assignors to Pet Care Systems, Detroit Lakes, Minn.

Continuation-in-part of application No. 08/713,097, Sep. 16, 1996, Pat. No. 5,690,052. This application Nov. 24, 1997, Appl. No. 977,172.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A01K *29/00*

U.S. Cl. 119—171 **6 Claims**

1. A method for sorbing an aqueous liquid utilizing a ground grain litter, the method comprising the steps of:

(a) selecting a whole raw grain having a moisture content of about 10–17%;

(b) grinding the whole raw grain to form a ground grain, the ground grain being of a type which, when water is intermittently added to the ground grain as it is sorbed until an excess of water lays over the ground grain and is allowed to sit for 20 minutes, does not increase in volume more than 100%;

(c) adding a dust reducing agent to the ground grain;

(d) providing 30 to 100% by weight of the ground grain of step (c) in a ground grain litter; and

(e) situating the ground grain litter of step (d) to be contacted by an aqueous liquid to be sorbed;

wherein the ground grain litter does not include an added gluten based media and the ground grain litter does not include added grain flour.

6,014,948

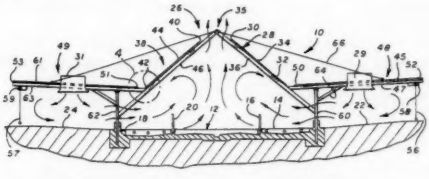
PROTECTIVE STRUCTURE FOR SHADING AND COOLING DAIRY COWS

R. Robert Gordon, 3225 E. Baseline Rd., Apt. 2070, Gilbert, Ariz. 85234

Filed Aug. 28, 1997, Appl. No. 919,920

Int. Cl.[7] A01K *1/00*

U.S. Cl. 119—449 **15 Claims**



1. A protective structure for dairy cows, the protective structure including a floor and generally extending along a central longitudinal axis, and comprising in combination:

a. a first roof member extending generally parallel to the central longitudinal axis, said first roof member being inclined and having an upper end generally supported above the central longitudinal axis of said protective structure;

b. a second roof member extending generally parallel to the central longitudinal axis, said second roof member being inclined and having an upper end generally supported above the central longitudinal axis of said protective structure, the upper end of said second roof member extending proximate and parallel to the upper end of said first roof member;

c. a first plurality of supports for supporting the lower end of said first roof member above the floor of the protective structure;

d. a second plurality of supports for supporting the lower end of said second roof member above the floor of the protective structure;

e. a third roof member extending generally along the central longitudinal axis and having a first edge supported by said first plurality of supports adjacent the lower end of said first roof member above the floor of the protective structure, said third roof member including a second edge opposite to said first edge;

f. a first elongated tension member extending generally between the upper end of said first roof member and the second edge of said third roof member for maintaining the second edge of said third roof member elevated above the floor of the protective structure and supporting said third roof member in cantilevered fashion;

g. a fourth roof member extending generally along the central longitudinal axis and having a first edge supported by said second plurality of supports adjacent the lower end of said second roof member above the floor of the protective structure, said fourth roof member including a second edge opposite to said first edge thereof; and

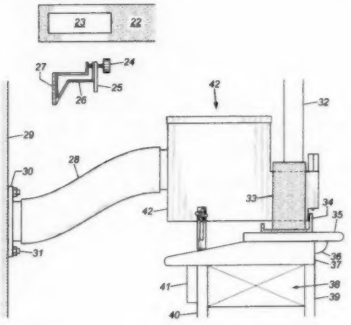
h. a second elongated tension member extending generally between the upper end of said second roof member and the second edge of said fourth roof member for maintaining the second edge of said fourth roof member elevated above the floor of the protective structure and supporting said fourth roof member in cantilevered fashion.

6,014,949

PRECONDITIONED AIR DELIVERY MANIFOLD SYSTEM FOR DOG HOUSES

Daniel W. Ball, Houston, Tex., assignor to Daniel Ball, Houston, Tex.

Filed Oct. 7, 1997, Appl. No. 943,974
Int. Cl.[7] F24F *3/044*
U.S. Cl. 119—484 **8 Claims**



1. A preconditioned air delivery system for dog houses usable in a house window for flowing air from a human's house to a dog house comprising:

a weather stripping means detachably attached in a house window further having a port having a first side being an intake side and a second side being an exhaust side;

tubing attached to said intake side of said port and said exhaust side of said port and wherein said tubing attached to said exhaust side of said port is further connected to a dog house;

damping means connected to said intake side of said port to regulate the amount of air flow from said human house through said intake side of said port and connected to said tubing;

a electric fan attached to said exhaust side of said port to cause air to flow through said damping means and into said intake side of said port, through said port, and into the exhaust side of said port and further into said tubing which is connected to said dog house;

cam means attached to the damping means enabling a microswitch to engage said electric fan when said damping means is adjusted to regulate the amount of air flow from said human house to said dog house;

electrical connecting means disposed in said tubing connecting said microswitch and said electric fan to a power source;

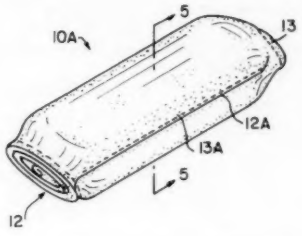
a bug screen attached to said damping means to prevent bugs from freely moving through the tubing from said dog house to said human house.

6,014,950

DOG TEETHING TOY

Nancy G. Rogers, 12919 82nd Ct., Palos Park, Ill. 60464

Filed Dec. 12, 1997, Appl. No. 990,170
Int. Cl.[7] A01K *29/00*
U.S. Cl. 119—710 **30 Claims**



1. A one-piece teething toy for an animal consisting essentially of:

a single sheet of absorbent cloth having peripheral edges

said sheet being arranged in a predetermined shape having multiple layers disposed in overlapping contact with one another and with at least portions of said peripheral edges exposed, and

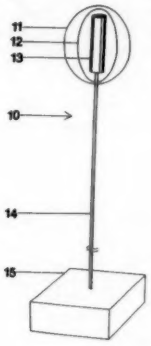
stitching securing together overlapping layers of said sheet along exposed ones of said peripheral edges for securing said sheet in said predetermined shape.

6,014,951

ELECTRODE DESIGN FOR DEER REPELLENT DEVICE

Keith M. Betzen, P.O. Box 5604, Bloomington, Ind. 47407-5604

Filed Jul. 6, 1999, Appl. No. 345,137
Int. Cl.[7] A01K *15/02*
U.S. Cl. 119—712 **5 Claims**



1. A deer repellent device, comprising a protective housing enclosing batteries and electronic components which provide a deterrent voltage across a plurality of electrodes, and having support means to hold said electrodes and a scent dispenser, and with said electrodes being arranged to surround said scent dispenser so that said deer, attracted to said device, will touch said electrodes, closing the circuit between said electrodes and so receive an electric shock,

with the improvement comprising said electrodes being configured to be almost complete circles opposed at 90 degrees which serve to completely surround said scent dispenser,

whereby said electrodes function to improve the chances of said deer contacting said electrodes, regardless of the height or angle of said device or the size or approach angle of said deer.

6,014,952

VALVE TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

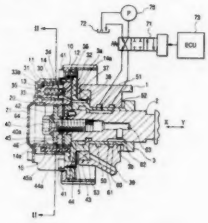
Osamu Sato, Takahama; Kiyoshi Sugimoto, Okazaki; Yoshihito Moriya, Nagoya; Noriyuki Iden, Toyota; Shinitiro Kikuoka, Okazaki, and Tadao Hasegawa, Toyota, all of Japan, assignors to Denson Corporation, Kariya, Japan, and Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

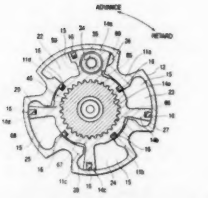
Filed Sep. 14, 1998, Appl. No. 152,270

Claims priority, application Japan, Sep. 16, 1997, 9-250615; Apr. 27, 1998, 10-117175

Int. Cl.[7] F01L *1/344;13/00*

U.S. Cl. 123—90.17 **8 Claims**





1. A valve timing control apparatus provided in a driving force transmitting mechanism for transmitting a driving force of an internal combustion engine to a driven shaft with a plurality of cams aligned in an axial direction and having different contours defining cam profiles for opening or closing at least one of intake and exhaust valves, said valve timing control apparatus comprising:

a driving rotary body rotating in synchronism with a driving shaft of said internal combustion engine;

at least one spline member rotating integrally with said driven shaft; and

a driven rotary body causing an angular displacement relative to said driving rotary body in response to a hydraulic pressure, said driven rotary body engaging with said spline member through a spline engagement so as to allow said driven shaft to shift in the axial direction,

wherein said one of said driving rotary body and said driven rotary body is a vane rotor and the other is a housing accommodating said vane rotor, allowing a relative displacement between said vane rotor and said housing within a predetermined angular region.

6,014,953

ROTARY SPARK IGNITED INTERNAL COMBUSTION ENGINE

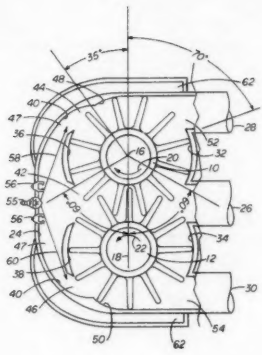
Thomas A. Vreeland, 5861 Geddes Rd., Ypsilanti, Mich. 48198

Provisional application No. 60/020,101, Jun. 19, 1996. This application Jun. 18, 1997, Appl. No. 878,003.

Int. Cl.[7] F02B *53/00*

U.S. Cl. 123—246 **3 Claims**

1. An internal combustion engine comprising a chamber and a pair of vaned rotors within the chamber, said vaned rotors mounted for rotation about parallel axes and spaced for intermeshing of the vanes as the rotors rotate,



a combustion chamber to one side of the rotors and within the chamber,

a pair of baffles separating the combustion chamber from the rotors and forming an inlet port to the combustion chamber and a pair of outlet ports from the combustion chamber,

an inlet conduit positioned to direct inlet air at the intermeshing vanes of the rotors and the outlet ports positioned to direct combustion gases at vanes spaced from the intermeshing vanes.

6,014,954

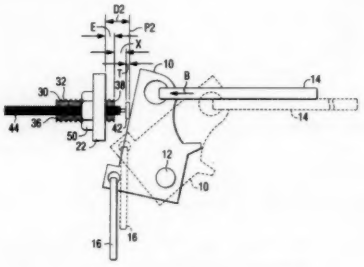
FINE ADJUSTMENT OF THE SLOW SPEED OPERATION OF AN ENGINE

Robert Kleeman, Fond du Lac, and David D. Liegeois, North Fond du Lac, both of Wis., assignors to Brunswick Corporation, Lake Forest, Ill.

Filed Dec. 19, 1997, Appl. No. 994,181

Int. Cl.[7] F02M *3/07*

U.S. Cl. 123—339.13 **10 Claims**



1. An engine speed control system, comprising:

a throttle plate connected to a throttle shaft;

a controller which is operatively connected to said throttle shaft to select an operating speed of said engine by rotating said throttle shaft in a first direction to decrease said engine speed and in a second direction to increase said engine speed;

a first stop mechanism, for limiting the movement of said throttle shaft to a first position in said first direction, which selects a first idle speed of said engine; and

a second stop mechanism, for limiting the movement of said throttle shaft to a second position in said first direction, which selects a second idle speed of said engine, said second stop mechanism being movable relative to said first stop mechanism, said second idle speed being faster than said first idle speed, said first stop mechanism comprises a generally tubular member having an outer threaded surface and an inner threaded aperture, said second stop mechanism being disposed in threaded association within said inner threaded aper-

ture, an axial end of said first stop mechanism defining said first position in cooperation with an adjustment head of said second stop mechanism being threaded into said inner threaded aperture.

6,014,955

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE USING AIR-AMOUNT-FIRST FUEL-AMOUNT-SECOND CONTROL METHOD

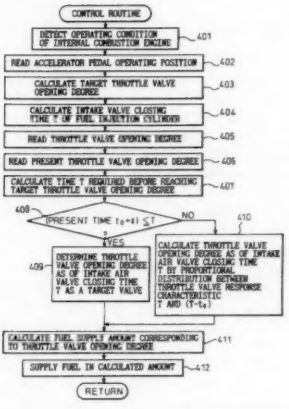
Ichiro Hosotani, Numazu; Hiroshi Tanaka; Naohide Fuwa, both of Susono; Iwao Maeda, Mishima; Shigeo Kikori, Toyota, and Ken Kuretake, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 17, 1997, Appl. No. 932,541

Claims priority, application Japan, Sep. 19, 1996, 8-247952; Dec. 6, 1996, 8-326965

Int. Cl.[7] F02D *41/34;11/10*

U.S. Cl. 123—399 **7 Claims**


CONTROL ROUTINE
DETECT OPERATING CONDITION OF INTERNAL COMBUSTION ENGINE
401
READ ACCELERATOR PEDAL OPERATING POSITION
402
CALCULATE TARGET THROTTLE VALVE OPENING DEGREE
403
CALCULATE INTAKE VALVE CLOSING TIME T OF FUEL INJECTION CYLINDER
404
READ THROTTLE VALVE OPENING DEGREE
405
READ PRESENT THROTTLE VALVE OPENING DEGREE
406
CALCULATE TIME T REQUIRED BEFORE REACHING TARGET THROTTLE VALVE OPENING DEGREE
407
408
PRESENT TIME t0+t1 ≦ T
NO
410
YES
409
DETERMINE THROTTLE VALVE OPENING DEGREE AS OF INTAKE AIR VALVE CLOSING TIME T AS A TARGET VALVE
CALCULATE THROTTLE VALVE OPENING DEGREE AS OF INTAKE AIR VALVE CLOSING TIME T BY PROPORTIONAL DISTRIBUTION BETWEEN THROTTLE VALVE RESPONSE CHARACTERISTIC T AND (T-t0)
CALCULATE FUEL SUPPLY AMOUNT CORRESPONDING TO THROTTLE VALVE OPENING DEGREE
411
SUPPLY FUEL IN CALCULATED AMOUNT
412
RETURN

1. An air-amount-first fuel-amount-second control apparatus an internal combustion engine having a fuel injection cylinder with an air intake valve, an accelerator pedal, and a throttle valve, the apparatus being for controlling the opening degree of the throttle valve and amount of fuel supplied to the fuel injection cylinder in accordance with the operating position of the accelerator pedal, comprising:

throttle valve drive means for driving the operation of the throttle valve in accordance with an input signal;

target throttle valve opening degree calculation means for calculating a target value of the throttle valve opening degree corresponding to the operating position of the accelerator pedal;

throttle valve response characteristic storage means for storing the response characteristic of the throttle valve before reaching a predetermined target opening degree;

intake air valve closing time calculation means for calculating the closing time of the air intake air valve in accordance with the operating condition of the internal combustion engine;

target value reaching time calculation means for calculating the time required for the throttle valve opening degree to reach a target value from said target throttle valve opening value produced by said target throttle valve opening degree calculation means and the value stored in said throttle valve response characteristic storage means;

throttle valve opening degree calculation means for calculating the throttle valve opening degree as of the calculated time of closing the intake air valve from the calculated target value reaching time of the throttle valve and the calculated intake air valve closing time;

fuel supply amount calculation means for calculating the fuel supply amount for a target air-fuel ratio from the ratio between the target air-fuel ratio and the intake air amount corresponding to the throttle valve opening degree as of the time of closing the intake air valve; and

fuel supply means for supplying the fuel in said calculated amount.

6,014,956

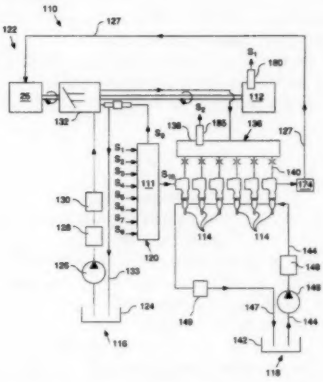
ELECTRONIC CONTROL FOR A HYDRAULICALLY ACTIVATED, ELECTRONICALLY CONTROLLED INJECTOR FUEL SYSTEM AND METHOD FOR OPERATING SAME

Gary L. Cowden, Morton; Brian G. McGee, Chillicothe; Daniel R. Puckett, Peoria, and John P. Timmons, Chillicothe, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 22, 1997, Appl. No. 996,278

Int. Cl.[7] F02M *37/04*

U.S. Cl. 123—446 **9 Claims**



1. An electronic control system for use with a compression ignition engine having a hydraulically actuated electronic unit fuel injector, said electronic control system comprising:

an electronic controller electrically connected to said hydraulically actuated electronic unit fuel injector;

an engine temperature sensor producing a signal responsive to a temperature of said engine and communicating the signal responsive to a temperature of said engine to the controller; and

wherein said electronic controller delivers a fuel injection signal to said hydraulically actuated electronic unit fuel injector, said fuel injection signal including a pull-in current duration time and a hold-in current duration time, said pull-in current duration time being a function of said signal responsive to the temperature of the engine.

6,014,957

FUEL PUMP MODULE FOR THE FUEL TANK OF AN AUTOMOTIVE VEHICLE

Barry Robinson, Williamsburg, Va., assignor to Siemens Automotive Corp., Auburn Hills, Mich.

Filed Nov. 27, 1996, Appl. No. 757,868

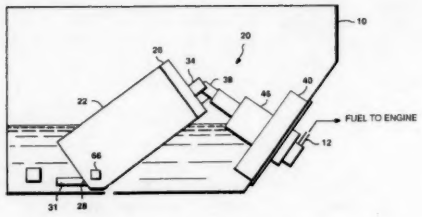
Int. Cl.[7] F02M *37/04*

U.S. Cl. 123—509 **15 Claims**

1. A fuel pump module for disposition in the fuel tank of an automotive vehicle to supply fuel to the engine of the vehicle, comprising:

a housing for disposition within the fuel tank including a fuel reservoir;

a fuel pump within said housing for pumping fuel from said reservoir and having a fuel outlet;



a member interconnecting said housing and said flange and having a passageway for receiving fuel from said fuel pump, said member including a first arm pivotally coupled to and disposed externally of said housing and a second arm connected to said flange and said first arm, said passageway extending through said first and second arms for flowing fuel from said reservoir to the engine of the vehicle; and

a flange for securement to the fuel tank;

a torsion spring coupled between said arms and said housing for biasing said housing for movement relative to said flange for reference to a bottom of the fuel tank.

6,014,958

ANTIDISSIPATION APPARATUS FOR EVAPORATED FUEL VAPOR

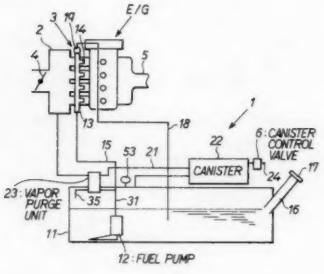
Makoto Miwa; Shigenori Isomura, both of Kariya; Toshihiko Muramatsu, Chiryu; Kazuji Minagawa, Tokoname; Takeshi Matsuda, Anjo, and Takahiko Kato, Chiryu, all of Japan, assignors to Denso Corporation, Japan

Filed May 12, 1998, Appl. No. 76,125

Claims priority, application Japan, May 12, 1997, 9-120819; Mar. 19, 1998, 10-069641

Int. Cl.[7] F02M *37/04*

U.S. Cl. 123—520 **23 Claims**



1. An antidissipation apparatus for evaporated fuel vapor for an internal combustion engine having an intake manifold, a fuel passage and a fuel tank comprising:

a purge passage which connects said intake manifold and said fuel tank;

a canister installed in said purge passage that adsorbs evaporated fuel vapor generated in said fuel tank; and

a purge pump installed in said purge passage that delivers said adsorbed evaporated fuel vapor to said intake manifold, said purge pump being driven by at least a part of a fuel flow in said fuel passage so that said purge pump changes its discharge amount of said adsorbed evaporated fuel vapor to said intake manifold according to an amount of said fuel flow in said fuel passage.

6,014,959

ENGINE WITH EGR MANAGEMENT SYSTEM

Thomas Tsoi-Hei Ma, Ferrers, United Kingdom, assignor to Ford Global Technologies, Inc., Dearborn, Mich.

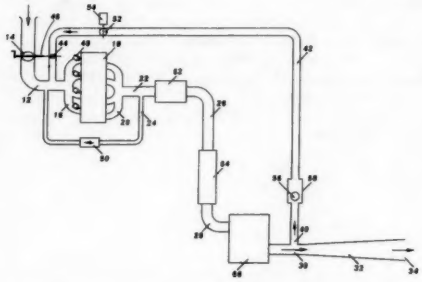
PCT No. PCT/GB97/01320, § 371 Date Dec. 11, 1998, § 102(e) Date Dec. 11, 1998, PCT Pub. No. WO97/44579, PCT Pub. Date Nov. 27, 1997

PCT Filed May 14, 1997, Appl. No. 180,945

Claims priority, application United Kingdom, May 18, 1996, 9610493

Int. Cl.[7] F02M *25/07*; **F02D** *21/08*

U.S. Cl. 123—568.19 **20 Claims**



1. A spark ignition internal combustion engine having an exhaust system connected thereto, the engine comprising:

an intake manifold;

a main throttle for regulating an intake of ambient air into the intake manifold,

an EGR pipe connected between a point in the intake manifold downstream of the main throttle and a point in the exhaust system located downstream of a main restriction to exhaust gas flow, such that an exhaust gas pressure at the latter point is substantially constant during engine operation, and

an EGR throttle rigidly connected for movement with the main throttle, the EGR throttle having a geometrical relationship to the main throttle such that a flow cross section of the main throttle and a flow cross section of the EGR throttle have a fixed predetermined ratio to one another for all positions of the main throttle.

6,014,960

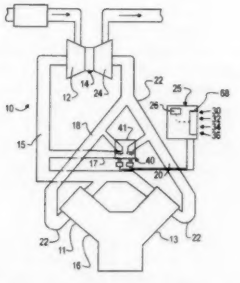
EXHAUST GAS RECIRCULATION CONTROL APPARATUS

Radek A. Oleksiewicz, Riverwoods, Ill., assignor to Navistar International Transportation Corp, Chicago, Ill.

Filed Nov. 9, 1998, Appl. No. 188,722

Int. Cl.[7] F02M *25/07*

U.S. Cl. 123—568.2 **11 Claims**



1. An internal combustion engine comprising:

a plurality of cylinder banks, each bank having an exhaust manifold and an associated exhaust passage fluidly separated

from an exhaust passage of another bank, and an intake manifold shared with the other bank;

an exhaust gas recirculation valve apparatus including:

a housing having a first and second separate exhaust inlet passages connected exclusively respectively at one end to each of said banks, said first passage having a first port communicating with the intake manifold and said second passage having a second port communicating with the intake manifold; and

first and second valve members mounted for linear movement in said housing, said first valve member being disposed to move from a closed position sealing said first port to an open position permitting exhaust flow from said first port to said intake manifold, said second valve member being disposed to move from a closed position sealing said second port to an open position permitting exhaust flow from said second port to said intake manifold, each of said valve members being functionally engaged to a linear actuator;

and an engine ECU operatively associated with said linear actuators to independently operate each of said first and second valve members to be either in said open position or said closed position to provide one of a plurality of predetermined valve position configurations providing varying amounts of EGR flow in response to at least one sensed operational parameter of the engine being monitored by the ECU falling within one of a plurality of predetermined ranges for such parameter stored in the ECU memory corresponding to said one of a plurality of predetermined valve position configurations, thereby providing a particular mode of exhaust gas recirculation.

6,014,961

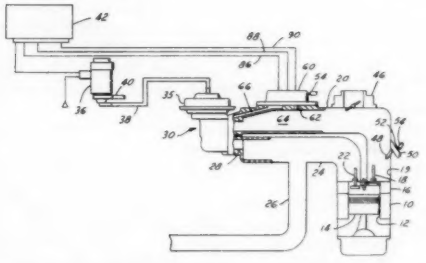
INTERNAL COMBUSTION ENGINE INTAKE SENSING SYSTEM

Freeman Carter Gates, Bloomfield Hills, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 23, 1998, Appl. No. 120,747

Int. Cl.[7] F02M *25/07;37/04*

U.S. Cl. 123—568.21 **15 Claims**



13. The pressure sensing systeme of claim **12** further including means, within the electronic controller, for subtracting a signal from the second sensor from a signal from the first sensor to produce an injector pressure signal.

6,014,962

ENGINE AIR-FUEL RATIO CONTROLLER

Ritsuo Sato, and Kimiyoshi Nishizawa, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

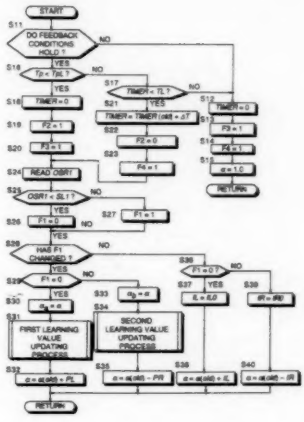
Filed Apr. 10, 1998, Appl. No. 58,301

Claims priority, application Japan, Apr. 11, 1997, 9-093959

Int. Cl.[7] F02D *41/14*

U.S. Cl. 123—674 **19 Claims**

1. An air-fuel ratio controller for controlling an air-fuel ratio of an air-fuel mixture supplied to an engine, comprising:



a fuel injection valve to inject fuel into the engine;

an oxygen sensor to detect an oxygen concentration in an exhaust of the engine, and

a microprocessor programmed to:

calculate a basic in section amount based on a running condition of the engine;

calculate a feedback correction amount based on the oxygen concentration so that the air-fuel ratio is controlled to be a predetermined air-fuel ratio;

store a learning value for a high load state, the learning value being calculated for a predetermined time based on the feedback correction amount when the high load state is developed, wherein the predetermined time is a time required to converge the learning value;

clamp the feedback correction amount in the high load state after the predetermined time has elapsed; and

calculate a fuel injection amount by correcting the basic injection amount with the learning amount for the high load state when the engine is in the high load state, wherein the fuel injection amount is injected from the fuel injection valve.

6,014,963

METHOD AND APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

Masaki Narita, Shizuoka-ken, Japan, assignor to Suzuki Motor Corporation, Hamamatsu, Japan

Filed Dec. 2, 1998, Appl. No. 203,847

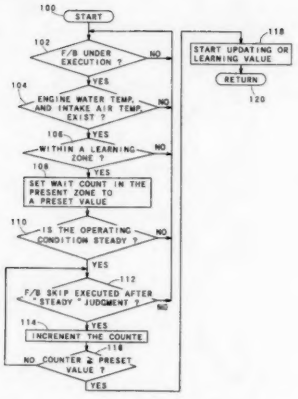
Claims priority, application Japan, Dec. 4, 1997, 9-350061

Int. Cl.[7] F02D *41/00*

U.S. Cl. 123—674 **5 Claims**

1. A method for controlling an air-fuel ratio in an internal combustion engine wherein, in accordance with a detection signal from an exhaust sensor disposed in an exhaust passage of the internal combustion engine, a preset feedback control is made by a control means so that the air-fuel ratio becomes a target value, an operation zone is divided into a plurality of zones, and when an operating condition of the internal combustion engine has entered one of said zones, if said operating condition is a steady condition, and after the preset feedback control has been conducted, a learning control is made to update a correction value in said feedback control for the zone concerned, wherein:

a stand-by function is added to said control means, and when the operating condition of the internal combustion engine has shifted between said zones, the learning control updates the


START
F/B UNDER EXECUTION ?
NO
YES
ENGINE WATER TEMP. AND INTAKE AIR TEMP. EXIST ?
WITHIN A LEARNING ZONE ?
SET WAIT COUNT IN THE PRESENT ZONE TO A PRESET VALUE
IS THE OPERATING CONDITION STEADY ?
F/B SKIP EXECUTED AFTER "STEADY" JUDGMENT ?
INCREMENT THE COUNTE
NO COUNTER ≥ PRESET VALUE ?
START UPDATING OR LEARNING VALUE
RETURN

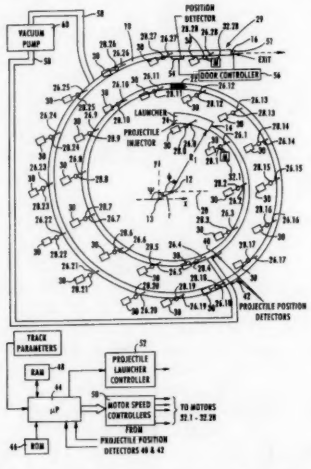
correction value, after the shift is performed, in accordance with said stand-by function.

6,014,964

METHOD AND APPARATUS FOR MOVING A MASS IN A SPIRAL TRACK

Derek A. Tidman, McLean, Va., assignor to Advanced Launch Corporation, McLean, Va.

Filed Oct. 29, 1998, Appl. No. 181,673
Int. Cl.[7] F41B *3/04*
U.S. Cl. 124—6 **44 Claims**



1. A method of smoothly moving a mass located in a track having a smooth spiral path comprising the step of moving the path so a portion of the spiral path where the mass is located is moved substantially radially along a local radius of curvature of the spiral path.

23. Apparatus for moving a mass to a high speed comprising a track having a smooth spiral path, the path being arranged and constructed to receive the mass so the mass can traverse the spiral path; and a drive for moving the path so a portion of the spiral path where the mass is located is moved substantially radially along a local radius of curvature of the path.

33. Apparatus for changing the velocity of a mass from an initial non-zero velocity to another non-zero velocity comprising a spiral track having a first end for receiving the mass while the mass is at the initial velocity, the track and the mass being arranged so the mass can move in the track after the mass has been received in the track at the initial non-zero velocity, a drive for gyrating the spiral track about an axis as the mass is moving in the spiral track, the drive and track being arranged to cause the mass to change velocity from the initial velocity to another velocity.

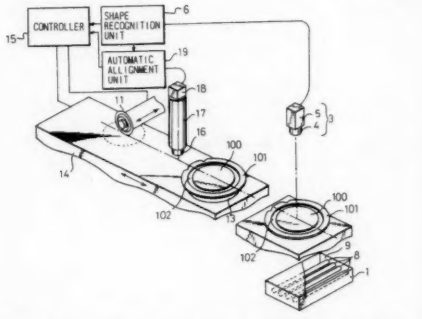
43. A method of increasing the velocity of a mass moving outwardly of an axis of a multi-turn spiral track, the axis being located in proximity to a center portion of the spiral track, the method comprising gyrating the spiral track about the axis in such a manner that the mass completes each turn in the spiral in about the same amount of time.

6,014,965

APPARATUS FOR RECOGNIZING THE SHAPE OF A SEMICONDUCTOR WAFER

Tetsuro Nishida, Mitaka, Japan, assignor to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Division of application No. 08/865,685, Jun. 2, 1997, abandoned, which is a continuation of application No. 08/674,987, Jul. 3, 1996, abandoned, which is a continuation of application No. 08/261,917, Jun. 16, 1994, abandoned. This application Jul. 6, 1998, Appl. No. 110,440.
Claims priority, application Japan, Aug. 19, 1993, 5-205257
Int. Cl.[7] B28D *1/04*
U.S. Cl. 125—12 **2 Claims**



1. A dicing apparatus for dicing a semiconductor wafer, said apparatus comprising:

a stage means for supporting a semiconductor wafer thereupon;

a shape recognizing apparatus for recognizing a shape of the semiconductor wafer, said shape recognizing apparatus including

an image pickup means for picking up an image of the semiconductor wafer and for providing video signals representing the image, the image pickup means being disposed at a position opposite to a surface of the semiconductor wafer,

a shape recognizing means for recognizing the shape of the semiconductor wafer by processing the video signals, the shape recognizing means also having an illuminating means for illuminating a semiconductor wafer in a manner to transmit light through an adhesive sheet with the semiconductor wafer adhered thereto, the illuminating means being disposed opposite to the image pickup means with the adhesive sheet with the semiconductor adhered thereto being interposed between the illuminating means and the image pickup means, wherein said illuminating means is a surface emitting type comprising a light source and a plate for scattering the light source so as to simultaneously illuminate the entire semiconductor wafer and the surrounding adhesive sheet with uniform light so that an image of the complete semiconductor wafer is received by said image pickup means that receives light transmitted through said adhesive sheet; said dicing apparatus further comprising

an alignment means to which the wafer is fed from said shape recognizing apparatus and for adjusting an orientation of said wafer based on the processed video signals;

dicing means for dicing said semiconductor wafer;

control means coupled to said dicing means and said shape recognizing means for controlling said dicing means to dice the semiconductor wafer in accordance with data obtained from the shape recognizing apparatus.

6,014,966

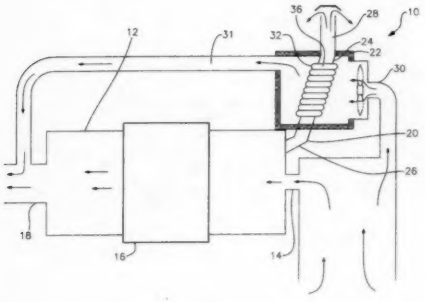
HEAT TRANSFER UNIT FOR A FURNACE EXHAUST VENT

James R. Stevenson, P.O. Box 1617, Mansfield, La. 71052

Filed Sep. 30, 1997, Appl. No. 940,645

Int. Cl.[7] F24B *7/04*

U.S. Cl. 126—110 R **1 Claim**



1. A heat exchange system for harnessing heat from an exhaust vent comprising:

a furnace having a main inlet for receiving cooled air drawn from a living area, heating means for heating the cooled air drawn from the living area, a main outlet for delivering to the living area air heated by the heating means, and an exhaust vent coupled to the furnace for expelling exhaust gases associated with the generation of heat by the heat means with such expelled exhaust gases not being suitable for channeling to the living area via the outlet;

a self-contained heat exchange device for positioning adjacent to the furnace, the self-contained heat exchange device comprising:

a housing constructed in a cubical configuration defining an interior of the housing, the exterior of the housing having an insulative material attached thereto, the housing having a bottom face thereof mounted adjacent to a top of the furnace and dividing the exhaust vent into a lower portion with an open top end and an upper portion with an open bottom, the open top of the lower end extending through the bottom face and the open bottom of the upper portion extending through a top face of the housing, the housing further having an auxiliary inlet and an auxiliary outlet forming an air path through the housing in parallel to an air path through the furnace, the auxiliary inlet being in communication with the main inlet for taking a portion of the cooled air drawn from the living area into an interior of the housing, the auxiliary outlet being in communication with the outlet for expelling air from the interior of the housing into the main outlet, the auxiliary inlet extending through a side face of the housing, the auxiliary outlet extending through a side face of the housing opposite the side face through which the auxiliary inlet extends such that air exiting the auxiliary inlet must travel through an entire length of the housing to reach the auxiliary outlet, the auxiliary outlet being located adjacent to the top face of the housing for exhausting the warmest air in the interior of the housing to the main outlet of the furnace;

heat transfer means completely contained in the housing, the heat transfer means including a pipe in tie housing having a circular cross-section which defines an area that is less than half a cross-sectional area of the exhaust vent, the pipe formed in the shape of a helix defined by a plurality of identical abutting loops which are situated about a common axis, wherein the axis of the loops is oriented at an angle to the vertical such that the axis resides along a diagonal of the housing, the heat transfer means being adapted to transfer heat from the air expelled through the exhaust vent to the air situated within the housing, the pipe having opposite upper and lower ends which are in fluidic communication with the respective open bottom and open top of the exhaust vent such that exhaust gases are passed through the loops; and

a motor driven fan situated completely in the interior of the housing in a location adjacent to the inlet of the housing and adapted to draw air from the living area through the main inlet of the furnace and direct air through the parallel air path through the housing and out the auxiliary outlet into the main outlet of the furnace for recirculation of the air back into the living area.

6,014,967

OPERATING METHOD FOR A SOLAR COLLECTOR PLANT, AND CONTROL UNIT FOR A LIQUID PUMP IN A SOLAR COLLECTOR PLANT

John Rekstad, Nedre Gronlivei 31B, N-1472, Fjellhamar; Bard Bjerke, Bekkestua, and Michaela Meir, Oslo, all of Norway, assignors to John Rekstad, Fjellhamar, Norway

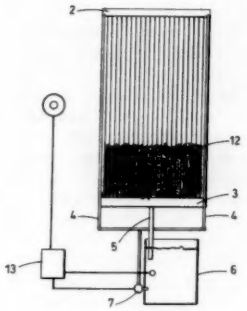
PCT No. PCT/NO97/00027, § 371 Date Oct. 21, 1998, § 102(e) Date Oct. 21, 1998, PCT Pub. No. WO97/28410, PCT Pub. Date Aug. 7, 1997

PCT Filed Jan. 31, 1997, Appl. No. 117,629

Claims priority, application Norway, Feb. 2, 1996, 960452

Int. Cl.[7] F24J *2/40*

U.S. Cl. 126—592 **15 Claims**



1. An operating method for a solar collector plant, said solar collector plant comprising a radiation absorber (**1**) having a surface layer facing the sun and a downward running channel system just underneath said surface layer for conducting a liquid (**12**) removing heat from said surface layer, particles (**11**) inside the channel system for lifting said liquid (**12**) by capillary effect for sweeping the under side of said surface layer, and a pump (**7**) providing circulation of said liquid (**12**) through said absorber (**1**), a pipe system (**2**, **3**, **4**, **5**), and a heat storage system (**6**) of the solar collector plant and operating in a start-up phase and a continuous operation phase, the operating method comprising:

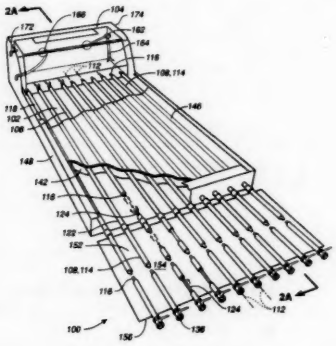
driving said pump (**7**) intermittently in the start-up phase with a number of shut-down periods and subsequent restarts, and controlling said pump by a control unit (**13**), for achieving effective removal of air from the absorber channel system.

6,014,968

TUBULAR HEATING-PIPE SOLAR WATER-HEATING-SYSTEM WITH INTEGRAL TANK

Siang Teik Teoh, Kuala Lumpur, Malaysia, assignor to Alam Hassan, San Jose, Calif.

Filed Aug. 29, 1996, Appl. No. 705,587
Claims priority, application Malaysia, Sep. 26, 1995, PI 950 2857; Jan. 24, 1996, PI-960 0267
Int. Cl.[7] F24J *2/44*
U.S. Cl. 126—639 12 Claims



1. A solar water-heating collector core (**106**) adapted for incorporation into a solar water-heating-system (**100**) either by being joined to a lower portion (**125**) of a hot-water storage-tank (**104**), or by being joined to a lower portion (**193**) of another solar water-heating-panel (**102**), the solar water-heating collector core (**106**) comprising:

a plurality of hollow heating-pipes (**108**), each heating-pipe (**108**) having a longitudinal axis (**112**) and an interior that is surrounded by an outer wall (**114**); said heating-pipes (**108**), when assembled to form the collector core (**106**), being arranged so the longitudinal axes (**112**) are disposed substantially parallel to each other; said heating-pipes (**108**) being adapted to be inclined to the horizontal when in use with an upper end (**118**) of each heating-pipe (**108**) being elevated above a lower end (**122**) of each heating-pipe (**108**); the lower end (**122**) of each heating-pipe (**108**) being closed, and the upper end (**118**) of each heating-pipe (**108**) being open and adapted to extend directly to, open into, and communicate directly with a lower level (**134**) of the hot-water storage-tank (**104**) or with the lower portion (**193**) of the solar water-heating-panel (**102**); and

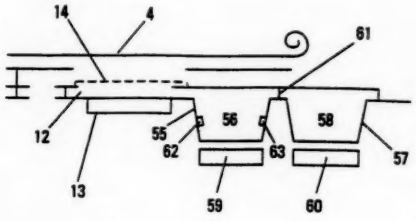
a plurality of hollow cooler-water return-pipes (**116**) each of which is surrounded by the outer wall (**114**) of one of the heating-pipes (**108**); the cooler-water return-pipe (**116**) within each heating-pipe (**108**) having an internal cross-sectional area that is approximately equal to one-third (⅓) to one-half (½) of an internal cross-sectional area of the outer wall (**114**) of the heating-pipe (**108**), and having a length that is slightly longer than a length of the outer wall (**114**) of the heating-pipe (**108**) so the open upper end (**132**) of the cooler-water return-pipe (**116**) extends beyond the open upper end (**128**) of the outer wall (**114**) thereby permitting the upper end (**132**) of the cooler-water return-pipe (**116**) to extend into and communicate directly with the lower level (**134**) of the hot-water storage-tank (**104**) or with the lower portion (**193**) of the solar water-heating-panel (**102**); and the lower end (**122**) of each cooler-water return-pipe (**116**) being perforated so fluid may flow outward from within the lower end (**122**) of each cooler-water return-pipe (**116**) toward the surrounding outer wall (**114**) of said heating-pipe (**108**).

6,014,969

DISPOSABLE PACKAGE FOR USE IN AEROSOLIZED DELIVERY OF ANTIBIOTICS

Lester John Lloyd, Orinda; Peter M. Lloyd, Oakland; Reid M. Rubsamen, and Jeffrey Arthur Schuster, both of Berkeley, all of Calif., assignors to Aradigm Corporation, Hayward, Calif.

Continuation of application No. 09/065,753, Apr. 24, 1998, which is a continuation of application No. 08/693,593, Aug. 2, 1996, Pat. No. 5,823,178, which is a division of application No. 08/630,391, Apr. 10, 1996, Pat. No. 5,660,166, which is a division of application No. 08/454,421, May 30, 1995, Pat. No. 5,718,222, which is a continuation of application No. 08/247,012, May 20, 1994, Pat. No. 5,544,646, which is a continuation-in-part of application No. 08/166,972, Dec. 14, 1993, Pat. No. 5,497,763, which is a continuation-in-part of application No. 08/065,660, May 21, 1993, Pat. No. 5,709,202.
This application Oct. 26, 1998, Appl. No. 179,255.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A61M *11/00*
U.S. Cl. 128—200.14 12 Claims



1. A disposable package, comprising:

a container having at least one wall which is collapsible by the application of a force the container having therein a dry pharmaceutically active antibiotic with at least one wall having an opening;

a porous membrane covering the opening wherein the membrane pores have a diameter in the range of from about 0.25 micron to about 6 microns; and

a liquid container having a flowable liquid therein, the liquid container being in fluid connection with the container having the dry antibiotic therein, wherein the liquid container is separated from the container having the dry antibiotic therein by a membrane which is ruptured upon the application of force.

6,014,970

METHODS AND APPARATUS FOR STORING CHEMICAL COMPOUNDS IN A PORTABLE INHALER

Yehuda Ivri, Irvine; Linda R. De Young, El Granada; Cheng H. Wu, Sunnyvale, all of Calif.; Miro S. Cater, Daytona Beach, Fla.; Vijay Kumar, and Markus Flierl, both of Sunnyvale, Calif., assignors to Aerogen, Inc., Sunnyvale, Calif.

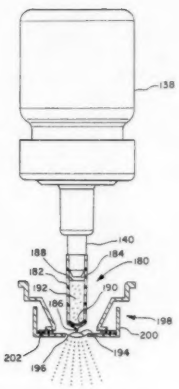
Filed Jun. 11, 1998, Appl. No. 95,737
Int. Cl.[7] A61M *11/00*
U.S. Cl. 128—200.16 15 Claims

1. A method for aerosolizing a substance, the method comprising:

coupling a cartridge to a liquid dispenser, the cartridge including a substance which is in a dry state;

dispensing a liquid from the dispenser into the cartridge, wherein the substance is dissolved into the dispensed liquid to form a solution;

transferring the solution from the cartridge and onto an atomization member; and



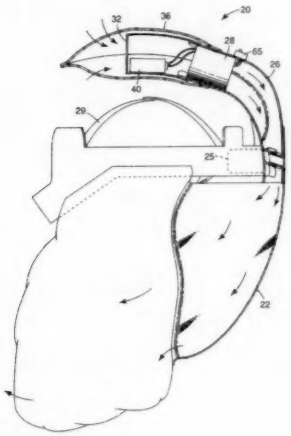
operating the atomization member to aerosolize the solution.

6,014,971

PROTECTIVE SYSTEM FOR FACE AND RESPIRATORY PROTECTION

Susan G. Danisch, Vadnais Heights; Michael R. Berrigan, Oakdale, and Patrick H. Carey, Jr., Bloomington, all of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Aug. 15, 1997, Appl. No. 911,833
Int. Cl.[7] A62B *7/10;19/00;23/02*
U.S. Cl. 128—201.25 **10 Claims**



1. A protective system, comprising:

a diffuser having a surface, an air entry, an air exit, and at least one internal baffle, said diffuser defining an air flow path, said surface generally complementary to a human forehead;

a substantially transparent face shield coupled to the diffuser;

a head cradle extending from the diffuser, said head cradle having a free end and a length extending generally between the free end and the diffuser, a portion of the length being sufficiently arcuate whereby, when in use, a portion of the head cradle generally conforms to a portion of the top and back of the wearer's head, the head cradle extends generally toward the wearer's occipital protuberance and said free end lodges against the wearer's head in a region generally beneath the occipital protuberance;

a blower coupled to the diffuiser for generating an air flow through the diffuser, said blower having an inlet and said blower operably coupled to a power source;

a filter operably coupled to the diffuser; and

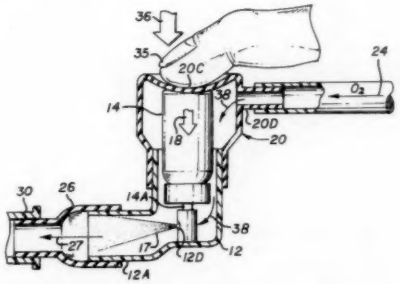
a generally pliable exit seal operably coupled to and disposed along the periphery of the face shield and adapted to generally engage and conform to the boundaries of a human head, thereby forming a breathing zone defined by the face shield, the surface of a wearer's face and the exit seal.

6,014,972

DRY DRUG PARTICLE DELIVERY SYSTEM AND METHOD FOR VENTILATOR CIRCUITS

David T. Sladek, Tucson, Ariz., assignor to Thayer Medical Corporation, Tucson, Ariz.

Filed Dec. 11, 1997, Appl. No. 989,085
Int. Cl.[7] A61M *15/00*
U.S. Cl. 128—203.12 **13 Claims**



1. Apparatus for introducing a measured dose of minute, dry medication particles into an inspiratory stream of a ventilator system including an inspiratory tube, a Y connector, and an endotracheal tube intubated in a patient, the apparatus comprising:

(a) a connector having an inlet port and first and second ports coupled to conduct the inspiratory stream through the connector;

(b) a medication dispensing device actuatable to eject a plume constituting a measured dose of minute, dry medication particles, the medication dispensing device including a mouthpiece, an internal nozzle structure for electing an expanding plume of medication particles toward the mouthpiece, a boot portion having an open end in fluid communication with the mouthpiece, and an MDI canister within the boot portion and having a stem inserted into an inlet of the nozzle structure; and

(c) a closed plume-containing structure receiving an expanding plume of minute dry medication particles from the mouthpiece, the plume-containing structure having a first port for insertion into the inlet port to direct the expanding plume to flow through the inlet port into the inspiratory stream, through the endotracheal tube, and into the lungs of the patient.

6,014,973

METHOD AND DEVICE FOR HEALING

Lauren Kaufman, 1228 Montgomery No. 6, San Francisco, Calif. 94133

Filed Dec. 31, 1997, Appl. No. 2,015
Int. Cl.[7] A61B *19/00*
U.S. Cl. 128—897 **25 Claims**

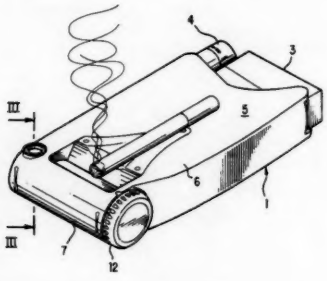
17. A device for healing a living body, comprising:

a securing means for securing healing elements;

a first healing element comprising moss agate secured to said securing means;

a second healing element comprising copper secured to said securing means;
a third healing element comprising malachite secured to said securing means;
a fourth healing element comprising tourmaline secured to said securing means;
a fifth healing element comprising a skeletal material from a once-living creature secured to said securing means.

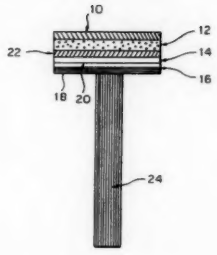
6,014,974
MULTI-PURPOSE ACCESSORY FOR SMOKERS
Mario Possamai, Via Asiago, 2, Conegliano, Italy, 31015
Filed Apr. 6, 1998, Appl. No. 55,282
Int. Cl.[7] A24F *47/00*
U.S. Cl. 131—185 **20 Claims**



1. A smoker's accessory comprising:
a case for housing a packet of cigarettes and a cigarette lighter, said case having a major surface and an end portion,
said end portion having a cylindrical body, said cylindrical body having a first slotted aperture,
a cylindrical container for receiving cigarette ash and butts insertable into said cylindrical body, said cylindrical container having a cylindrical side wall and a second slotted aperture, and
said cylindrical container being rotatable between a first position where said first slotted aperture and second slotted aperture are in registry for receiving ashes and butts and a second position where said first slotted aperture and second slotted aperture are out of registry said first slotted aperture is closed by said cylindrical side wall of said cylindrical container when said first slotted aperture and said second slotted aperture are out of registry.

6,014,975
SHAVING METHOD
Robert W. Benzinger, 3461 Rockaway Ave., Annapolis, Md. 21403
Continuation-in-part of application No. 08/417,890, Apr. 6, 1995, abandoned. This application Jun. 6, 1995, Appl. No. 471,458.
Int. Cl.[7] A45D *24/00*
U.S. Cl. 132—200 **19 Claims**

1. A method of shaving with a shaver having a blade on a razor head portion of the shaver wherein the method extends the shaving lifetime of the blade while reducing cuts and nicks comprising:
soaking the razor head of the shaver with the blade thereon in a bath comprising a solution of witch hazel;
removing the shaver with the blade thereon from the bath;
shaving with the shaver having the blade thereon while the blade thereof has the solution of witch hazel from the bath thereon;
returning the shaver to the bath comprising the solution of witch hazel to store and soak until again shaving with the shaver having the blade; and



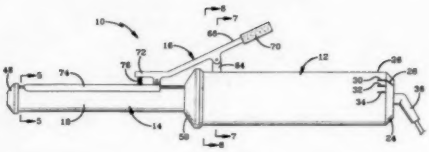
repeating the previous steps.

6,014,976
SPHERICAL HAIR STYLING DEVICE
Sabrina R. Denebeim, 260 Avila St., San Francisco, Calif. 94123
Continuation of application No. 08/764,554, Dec. 12, 1996, Pat. No. 5,755,242, and a continuation-in-part of application No. 08/644,616, May 1, 1996, Pat. No. 5,711,323, which is a continuation-in-part of application No. 08/363,256, Dec. 23, 1994, Pat. No. 5,515,874. This application Jan. 16, 1998, Appl. No. 8,280.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A45D *1/04*
U.S. Cl. 132—232 **10 Claims**

1. A component for a hair styling device comprising:
a brush head having a substantially spherical shape, wherein the brush head defines holes which allow the passage of air through the brush head; and
a plurality of projections radiating out from said brush head, the plurality of projections sized to style human hair.

6,014,977
CURLING IRON WITH ADJUSTABLE BARREL
Donna K. Friedman, 8071 Oakdale, NW., Massillon, Ohio 44646
Provisional application No. 60/090,328, Jun. 23, 1998. This application Jun. 22, 1999, Appl. No. 337,769.
Int. Cl.[7] A45D *1/04*
U.S. Cl. 132—232 **19 Claims**

1. A curling iron comprising:
a handle;
a barrel mounted on the handle;
a clip assembly connected to the barrel;
the clip assembly and barrel movable between first and second positions;



the barrel having a first diameter at the first position and a second diameter at the second position; and

the first diameter being smaller than the second diameter.

6,014,978

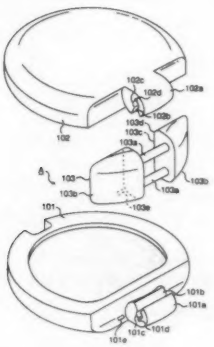
COMPACT COSMETIC CASE CAPABLE OF DISPLAYING THE INSIDE THEREOF

Yukitomo Yuhara, Tokyo, Japan, assignor to Yoshida Kogyo Co., Ltd., Tokyo, Japan

Filed May 28, 1999, Appl. No. 321,613

Int. Cl.[7] A45D *33/00*

U.S. Cl. 132—293 **3 Claims**



1. A cosmetic case capable of displaying the inside of the case, comprising:

a housing for containing a cosmetic material, the housing having an opening for exposing the surface of the cosmetic material;

a lid for closing the opening formed at the housing; and

a hinge member attached to each edge of the housing and the lid to rotatably connect the housing and the lid with each other so that respective outer surfaces of the housing and the lid come to face closely to each other, the hinge member comprising:

a pair of shafts members; and

a pair of support members, each support member arranged on each end of the pair of the shaft members,

wherein each of the housing and the lid has a coupling portion having a fitting groove for fitting one of the shaft members to hide the shaft members and to expose the support members on opposite sides of the coupling portion.

6,014,979

LOCALIZING CLEANING PLASMA FOR SEMICONDUCTOR PROCESSING

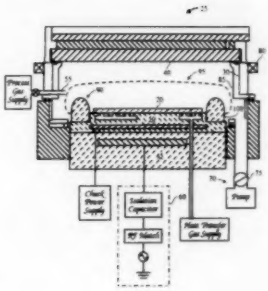
Luc Van Autryve, Voinsles, France, and Stefan Oswald Lang, Holzgerlingen, Germany, assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jun. 22, 1998, Appl. No. 102,964

Int. Cl.[7] B08B *7/00;* **H05H** *1/02*

U.S. Cl. 134—1.1 **20 Claims**

1. A method of processing a substrate in a process chamber, the method comprising the steps of:



(a) in a processing stage, placing the substrate in the process chamber, maintaining a surface of sacrificial material around the substrate, introducing process gas into the process chamber, and energizing the process gas whereby the surface of sacrificial material adds or removes species from the process gas to change a processing rate at the substrate periphery; and

(b) in a cleaning stage, removing the substrate, introducing a cleaning gas into the process chamber, and forming a localized cleaning plasma sheath from the cleaning gas that is localized to the surface of the sacrificial material to remove process residue formed on the surface of the sacrificial material substantially without extending to and eroding sidewalls of the process chamber.

6,014,980

FREE-ARM CANOPY

Gustav Adolf Glatz, Frauenfeld, Switzerland, assignor to Glatz AG, Frauenfeld, Switzerland

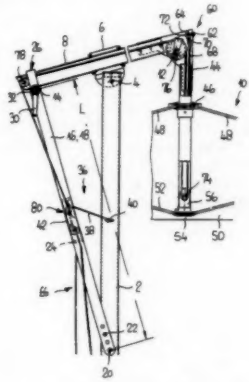
PCT No. PCT/CH96/00267, § 371 Date Jan. 21, 1998, § 102(e) Date Jan. 21, 1998, PCT Pub. No. WO97/04682, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 25, 1996, Appl. No. 25

Claims priority, application Switzerland, Jul. 25, 1995, 2202/95

Int. Cl.[7] A45B *17/00;23/00;11/00*

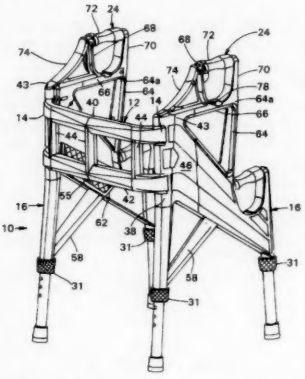
U.S. Cl. 135—20.1 **23 Claims**



1. A free arm-canopy including a mast (**2**, **2***a*) on which a jib (**8**, **8***a*) is guided for movement between extended and retracted positions and is supported by means of a connecting strut (**16**, **18**, **16***a*, **18***a*) which is articulately secured to the mast (**2**, **2***a*) and to the jib (**8**, **8***a*), the jib being securable in the extended position by means of a first detent device (**36**, **100**) and carrying an articulated folding canopy (**10**) at an end thereof facing away from the mast (**2**,**2***a*), said canopy having a crown (**46**) with articulated canopy rods (**48**)

on which supporting struts (**52**) are articulated, which supporting struts are articulated on a slider (**54**), the jib (**8**, **8***a*) being guided on the mast (**2**, **2***a*) and on the strut (**16**, **18**, **16***a*, **18***a*) such that it may swivel about its own axis, and a securing device (**26**, **26***a*, **26***b*, **28**, **82**) for securing the jib in a swiveled position.

6,014,981
WALKER FORMED SUBSTANTIALLY FROM A POLYMER
Karl J. Douglass, 3730 Dogwood La., Doylestown, Pa. 18901
Filed Oct. 6, 1997, Appl. No. 944,317
Int. Cl.[7] A61H *3/00*
U.S. Cl. 135—67 **26 Claims**

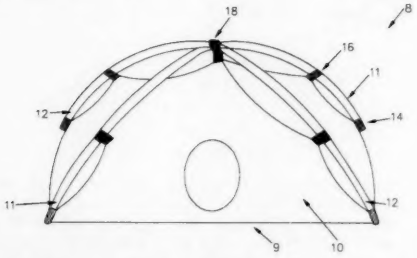


1. A walker comprising:

a front frame having opposing lateral ends and being formed substantially from a polymer; and

first and second side frames connected to the front frame at the lateral ends thereof, respectively, each side frame being pivotable with respect to the front frame about a generally vertical pivot axis generally coextensive with the respective lateral end, each side frame being formed substantially from a polymer and having fore and aft generally vertical leg portions and a first handle positioned at an upper region of each side frame.

6,014,982
PYRAMIDAL TENT-LIKE STRUCTURE
Darlene Strevey, 2036 Royal Fern Ct., 12A, Reston, Va. 20191
Filed May 14, 1997, Appl. No. 856,287
Int. Cl.[7] E04H *15/36*
U.S. Cl. 135—124 **35 Claims**



1. A tent-like structure, comprising:

a base having four sides of substantially equal length and four corners;

a canopy having a substantially pyramidal shape, said canopy having four lateral edges, four basal edges, and an apex;

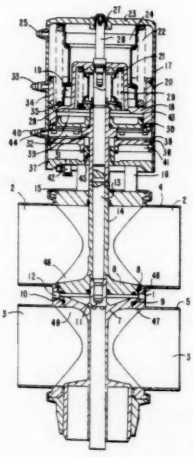
an apical retaining loop secured to said canopy at substantially said apex of said canopy, the apical retaining loop including an upper apical retaining loop and a lower apical retaining loop;

four lateral retaining loops, one of said four lateral retaining loops secured to each of said four lateral edges of said canopy, and said four lateral retaining loops spaced equidistant from said apex of said canopy;

four basal retaining boots, one of said four basal retaining boots secured to each of said four lateral edges at a location on each of said four lateral edges adjacent to each of said four corners of said base; and

first and second support members each comprising a continuous flexible rod, each of said first and second support members passing within and retained by respective ones of the upper and lower apical retaining loops, each of said first and second support members passing within and retained by two of said lateral retaining loops, and each end of each of said first and second support members inserted into and retained by one of said four basal retaining boots, wherein said first and second support members each form an arc, said arc concave with respect to said base, and said first and second support members intersect at a point substantially immediately above said apex.

6,014,983
STOP VALVE
Bjarne Sondergaard, Kolding; Per Schneiderreit, Vamdrup, and Jensen Karl-Age Lindholm, Odense, all of Denmark, assignors to Alfa Laval LKM A/S, Kolding, Denmark
PCT No. PCT/EP96/03998, § 371 Date Jun. 11, 1998, § 102(e) Date Jun. 11, 1998, PCT Pub. No. WO97/24541, PCT Pub. Date Jul. 10, 1997
PCT Filed Sep. 12, 1996, Appl. No. 91,089
Claims priority, application Germany, Dec. 27, 1995, 195 48 860
Int. Cl.[7] F16K *11/20;51/00*
U.S. Cl. 137—312 **9 Claims**



1. A double seat valve with leakage protection, in particular for the food and beverage industry, which in its housing has two cooperating valve plates (**6**, **7**), which define a hollow leakage chamber (**10**) that typically opens into the open air via lines (**11**), wherein for actuating both valve plates (**6**, **7**), one common drive is provided, which includes a cylinder (**17**) with a first work piston (**18**), loaded on both sides by compression springs (**29**, **22**) and

being fixedly connected to the valve shaft (**13**) of the lower valve plate (**7**), wherein this valve shaft (**13**) passes in telescoping fashion through the upper valve plate (**6**) and its tubular shaft (**14**), which in turn protrudes with its upper end into the cylinder (**17**) and there carries an abutment (**28**) for the lower compression spring (**29**) that presses the upper valve plate (**6**) into its seat (**8**), while the upper compression spring (**22**), which is braced by its upper end on the upper cylinder cap (**23**), presses the lower valve plate (**7**) against its valve seat (**9**), and a second work piston (**36**), acting on the tubular shaft, is disposed in the cylinder (**17**) below the first work piston (**18**), and a third work piston (**30**) which is movable on the tubular shaft is disposed between the first and second work pistons, wherein the third work piston (**30**) is sealingly surrounded on its circumferential surface by the first work piston (**18**), and the first and third work pistons are embodied as displaceable relative to one another, characterized in that by the first work piston (**18**) and the third work piston (**30**) a second work chamber (**32**) is formed, which is embodied such that it can be subjected to compressed air via a conduit (**35**), and the first work piston (**18**) has a first (**43**) and a second abutment (**44**), which limits the stroke of the third work piston (**30**).

6,014,984

VALVE

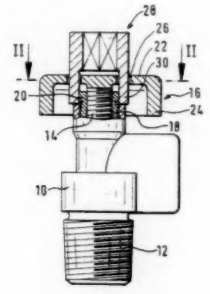
Jean-Claude Schmitz, Heisdorf, and Léon Kerger, Helmdange, both of Luxembourg, assignors to Luxembourg Patent Company, S.A., Luxembourg

Filed Dec. 4, 1997, Appl. No. 984,836

Claims priority, application Luxembourg, Dec. 13, 1996, 88 853

Int. Cl.[7] **F16K** *43/00;31/60;41/02*

U.S. Cl. 137—315 **39 Claims**



1. A valve comprising a body, an internal opening and closing member, an external operating wheel connected by a connecting rod directly or indirectly to the opening and closing member, a stuffing box through which the said rod passes and which is screwed in leaktight manner into the body of the valve, the said stuffing box having a head that can be operated on using an appropriate tool to be screwed or unscrewed, wherein there is a peripheral skirt associated with at least one of the valve body or the operating wheel and completely surrounding the head of the stuffing box and preventing lateral access thereto, in that the wheel has at least two perforations and in that the said appropriate tool has claws, a cross section of which complements the said perforations and the head of the stuffing box so that they can pass through the operating wheel and engage with the head of the stuffing box.

6,014,985

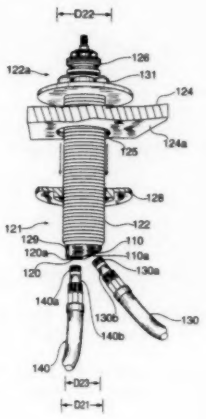
DROP-IN FAUCET VALVE

Jerome Warshawsky, Hewlett Harbor, N.Y., assignor to IW Industries, Inc., Melville, N.Y.

Continuation-in-part of application No. 08/859,163, May 20, 1997, Provisional application No. 60/043,989, Apr. 3, 1997. This application May 8, 1998, Appl. No. 75,095.

Int. Cl.[7] **F16L** *5/00*

U.S. Cl. 137—359 **8 Claims**



1. A drop-in faucet valve assembly installable to a sink from above a sink countertop comprising:

an outer cylindrical sleeve, said outer sleeve having a first predetermined diameter less than a second predetermined diameter of a hole in the sink countertop,

a valve being seated within said cylindrical sleeve;

said cylindrical sleeve including a water flow fitting portion having a third predetermined diameter less than or equal to said first predetermined diameter of said cylindrical sleeve;

said water flow side fitting portion extending coterminous with, and axially parallel to, said cylindrical sleeve, and,

said water flow fitting portion including a pair of female threaded couplings engageable with a pair of flexible water flow conduits,

a first coupling of said pair of couplings being obliquely oriented off of an axis of said cylindrical sleeve, and,

a second coupling of said pair of couplings being oriented parallel to the axis of said cylindrical sleeve.

6,014,986

VALVE FOR A COOKING UTENSIL

Gerd-Diethard Baumgarten, Wilnsdorf-Wilden, Germany, assignor to Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile, Neunkirchen, Germany

Filed Nov. 25, 1998, Appl. No. 200,260

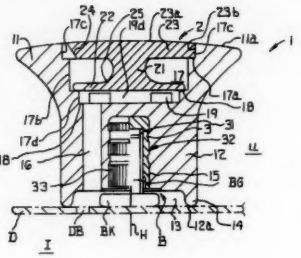
Int. Cl.[7] **F16K** *15/00;* **B65D** *51/16*

U.S. Cl. 137—526 **21 Claims**

1. A valve for a cooking utensil which can be closed off with a lid, the valve comprising a valve member, said valve member having a valve seat which cooperates with a valve plate blocking until a given underpressure, wherein:

(a) the valve plate has a seal collar, which is provided on its corpus, and extends around said corpus, is flexible and, when the valve is closed, rests on the valve seat; and

(b) at least one swivel edge, which is spaced from the valve seat, and is provided within an otherwise free open flow cross section and approximately in the plane of the valve seat, the swivel edge is provided on the valve member for the seal



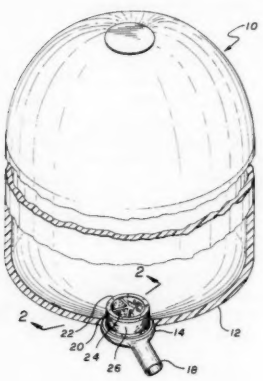
collar, the seal collar being capable of placement against the swivel edge at a relatively small partial section of its circumference.

6,014,987

ANTI-VORTEX BAFFLE ASSEMBLY WITH FILTER FOR A TANK

Michael Carl List, and Jennifer Erin Kinzy, both of Lancaster, Calif., assignors to Lockheed Martin Corporation, Palmdale, Calif.

Filed May 11, 1998, Appl. No. 75,912
Int. Cl.[7] B64D *37/20;* **F15D** *1/00*
U.S. Cl. 137—549 **10 Claims**



1. An anti-vortex assembly for mounting at the entrance to an outlet port of a propellant tank comprising:

a hollow cylindrical frame assembly having a longitudinal axis and open top and bottom ends, said frame assembly having top and bottom circular shaped support members connected together by equally spaced vertical support members;

a baffle assembly mounted within said frame assembly, said baffle assembly comprising a plurality of perforated baffle plates having first and second ends; said first ends joined together at said longitudinal axis of said frame assembly and said second ends joined to said vertical support members of said frame assembly;

a first cylindrical shaped filter assembly mounted about the periphery of said frame assembly;

a second flat disc shaped filter assembly mounted over said top end of said frame assembly and joined thereto; and

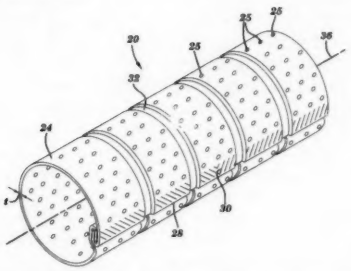
fastener means for securing said frame assembly and said first filter assembly to the tank about the periphery of the outlet port.

6,014,988

BEADED CENTER TUBE

Louis R. Gagnon, Weymouth; William P. Pope, Jr., Braintree, and Richard H. Marson, Needham, all of Mass., assignors to The Newcan Co., Inc., Holbrook, Mass.

Continuation of application No. 09/038,415, Mar. 11, 1998. This application Oct. 20, 1998, Appl. No. 175,641.
Int. Cl.[7] F16L *9/00*
U.S. Cl. 138—168 **29 Claims**



1. A tube adapted for use in a fluid filter, said tube comprising:

a perforated metallic sheet formed so that first and second edges thereof are mutually engaged to form a longitudinal lockseam having a plurality of thicknesses of said metallic sheet and being free from chemical and adhesive bonds;

a plurality of circumferential beads formed at spaced locations along the length of said tube to provide structural reinforcement;

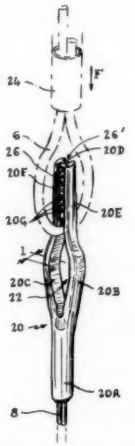
wherein each of said plurality of circumferential beads is extended through said lockseam while substantially maintaining said mutual engagement.

6,014,989

DEVICE FOR CONNECTING A HEDDLE TO A HARNESS CORD

Michel Tachon, Lyons, and Patrick Vessella, Decines Charpieu, both of France, assignors to Staubli Lyon, Chassieu, France

Filed Nov. 2, 1998, Appl. No. 184,068
Claims priority, application France, Nov. 5, 1997, 97 14181
Int. Cl.[7] D03C *3/40*
U.S. Cl. 139—88 **20 Claims**



1. A device for connecting a heddle of a weaving loom of Jacquard-type to a cord belonging to a harness of the loom, the device comprising;

an endpiece adapted to be molded on an upper end of the heddle, said endpiece having an orifice adapted to receive a harness cord therethrough, and

a sheath of a size to surround at least a portion of said endpiece and said orifice and adapted to secure a harness cord extending through said orifice to said endpiece.

6,014,990

FILLING YARN STRETCHING DEVICE FOR A LOOM

Jean-Marie Bamelis; Chris Delanote, and Jozef Peeters, all of Ypres, Belgium, assignors to Picanol N.V., Ypres, Belgium

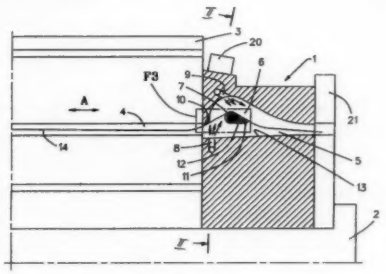
PCT No. PCT/EP96/04282, § 371 Date Apr. 2, 1998, § 102(e) Date Apr. 2, 1998, PCT Pub. No. WO97/13017, PCT Pub. Date Apr. 10, 1997

PCT Filed Oct. 1, 1996, Appl. No. 43,573

Claims priority, application Belgium, Oct. 2, 1995, 9500814

Int. Cl.[7] **D03D** *47/30*

U.S. Cl. 139—194 **9 Claims**



1. In an airjet loom including a reed (**3**); a filling yarn insertion conduit (**4**) associated with the reed and extending along a filling yarn insertion direction (A), a main filling yarn receiving channel (**5**) having an inlet located adjacent an exit end of the conduit and arranged to receive a filling yarn moving along an insertion direction; a branch channel (**6**) in communication with and located adjacent one side of the main channel (**5**); a first blow nozzle (**8**) located adjacent the inlet of the main channel and discharging into the main channel in a direction transversely of the main channel and towards the branch channel; and a filling yarn deflection location within the branch channel downstream of said blow nozzle; the improvement comprising:

at least one wear resistant element (**7**, **10**, **11**) disposed in said branch channel at said yarn deflection location and extending transversely to the insertion direction of the filling yarn (**14**);

said branch channel (**6**) extending from a branch channel inlet adjacent the main channel inlet along a curved path leading away from and then back to the main channel;

said at least one wear resistant element being mounted at the inlet end of the branch channel.

6,014,991

METHOD OF MONITORING THE FUNCTION OF A STOP MOTION ARRANGEMENT IN AN AIR JET LOOM

Dieter Teufel, Langenargen, Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Germany

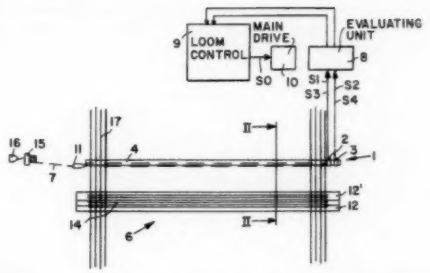
Filed Apr. 21, 1998, Appl. No. 64,043

Claims priority, application Germany, Apr. 21, 1997, 197 16 587

Int. Cl.[7] **D03D** *51/34*

U.S. Cl. 139—370.2 **22 Claims**

1. A method of monitoring the function of a first weft sensor and a second weft sensor included in a stop motion arrangement provided in a fluid jet loom that is operated in successive weaving cycles, said method comprising the following steps in each respective one of said weaving cycles:



a) emitting a weft arrival signal (**S1**) from said first weft sensor to an evaluating unit if a respective inserted weft thread reaches said first weft sensor during a first time interval (α**1**);

b) emitting a weft fault signal (**S2**) from said second weft sensor to said evaluating unit if said respective inserted weft thread reaches said second weft sensor during said first time interval (α**1**);

c) emitting a respective test signal (**S4**) from at least said second weft sensor to said evaluating unit at a time outside of said first time interval if said at least said second weft sensor is functioning, by positively actuating said at least said second weft sensor at said time outside of said first time interval; and

d) using said evaluating unit, evaluating whether said weft arrival signal (**S1**) has been emitted, whether said weft fault signal (**S2**) has been emitted, and whether said test signal (**S4**) has been emitted, and responsively to a result of said evaluating, either emitting a loom stop signal to a loom control for stopping a main drive of said loom or continuing said evaluating in a next successive one of said weaving cycles.

6,014,992

MECHANICAL LOOM WITH PNEUMATIC WEFT THREAD INSERTION WITH SYNCHRONIZED CLAMP CUTTER AND REED

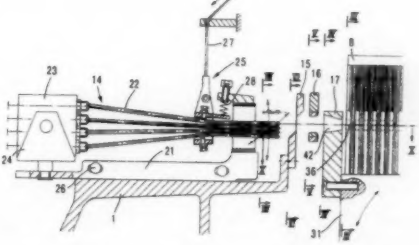
Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

PCT No. PCT/CH95/00230, § 371 Date Apr. 7, 1998, § 102(e) Date Apr. 7, 1998, PCT Pub. No. WO97/13901, PCT Pub. Date Apr. 17, 1997

PCT Filed Oct. 10, 1995, Appl. No. 51,568

Int. Cl.[7] **D03D** *47/30;47/34;47/38*

U.S. Cl. 139—435.1 **13 Claims**



1. Weaving machine with pneumatic weft thread insertion, the weaving machine comprising a reed (**8**) and a weft thread guide apparatus (**32**) which are connected to one another and are pivotal between an insertion position and a beat-up position, and a weft insertion apparatus (**14**) which is arranged in a fixed spatial position and has at least one blower nozzle (**22**) for insertion of a weft thread (**38**) into a guide passage (**36**), a thread clamp (**16**) and a shear (**15**), with the thread clamp being coupled to the reed in order to clamp an inserted weft thread (**38**) and to forward it synchro-

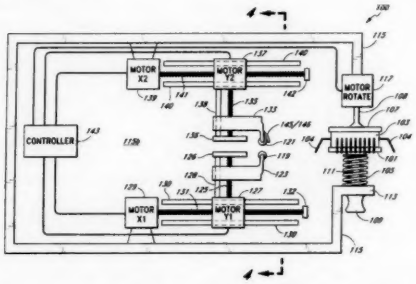
nously with the guide passage (**36**) from an insertion location up to the beat-up position, and with the shear (**15**) being placed after the thread clamp (**16**) in a beat-up direction of the reed in order to sever off the weft thread after clamping.

6,014,993

METHOD AND APPARATUS FOR CONFIGURING COMPONENT LEADS

Fred A. Goins, III, Boise, Id., assignor to MCMS, Inc., Nampa, Id.

Filed Mar. 27, 1998, Appl. No. 49,763
Int. Cl.[7] **B21F** *45/00*
U.S. Cl. 140—105 **44 Claims**



1. An apparatus for configuring a plurality of leads of a component, comprising:

a securing structure which receives and holds the component;

a first member which engages the plurality of leads of the component; and

a second member which engages the plurality of leads of the component, wherein the first and second members each move with respect to the leads so as to bend;

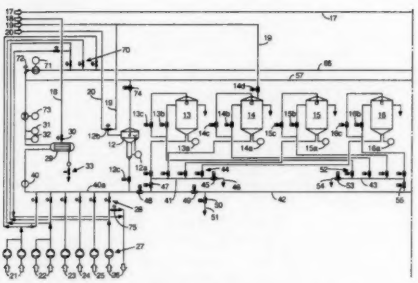
a first portion of each of the plurality of leads about a portion of the first member and to substantially bend a second portion of each of leads about a portion of the second member, to thereby form the plurality of leads into a desired shape.

6,014,994

PLANT FOR CLEANING A FILLING PLANT

Michael G. Schmidt, Wiesbaden, Germany, assignor to DiverseyLever, Inc., Plymouth, Mich.

Filed Sep. 14, 1998, Appl. No. 152,781
Claims priority, application Germany, Sep. 18, 1997, 197 41 242 U
Int. Cl.[7] **B65B** *1/04*
U.S. Cl. 141—89 **10 Claims**



1. A plant for cleaning a filling plant having a filler (**1**) and conveyor (**2**), which plant comprises a CIP cleaning system (**3**, **4**, **5**) for the filler (**1**) and the conveyor (**2**) as well as a filler external cleaning system (**6**, **7**) and a hot water flooding system (**8**, **9**), characterized in that for all partial cleaning systems there are provided

in a common central cleaning circuit (**40***a*, **57**) a common supply station (**10**), comprising the components:

fresh water container (**12**),

storage container (**13–16**),

a heating station (**29**),

a dosing station (**27**),

which can selectively be connected to and disconnected from the cleaning circuit by means of valves and rotary valve flaps,

a programme control system (**11**), which possesses programme parts both for a sequential and also for a partially parallel activation of the partial cleaning systems, and

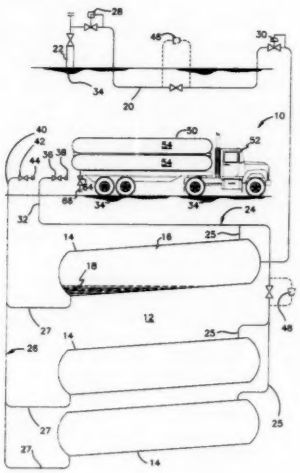
a common partial line system.

6,014,995

ONSITE PETROCHEMICAL STORAGE AND TRANSPORT SYSTEM

A. Patrick Agnew, 33 Sunset Way SE, Calgary, Alberta, Canada, T2X 3H6

Filed Jul. 31, 1998, Appl. No. 126,747
Int. Cl.[7] **F17D** *1/00*
U.S. Cl. 141—231 **7 Claims**



1. An onsite petrochemical storage and transport system, which includes an onsite gas and liquid storage facility comprising:

an underground array of elongated storage tanks, wherein each of said storage tanks are sloped with one end lower than the other end for two-phase removal of a gas and a liquid;

an underground pipeline extending between a conventional gas and liquid well to a first one of said storage tanks;

an underground top gas header having gas pipes extending between top high ends of all said storage tanks to allow said gas to flow freely between said storage tanks under pressure; and

an underground bottom liquid header having liquid pipes extending between bottom lower ends of all said storage tanks, to allow said liquid to flow freely between said storage tanks under pressure.

6,014,996

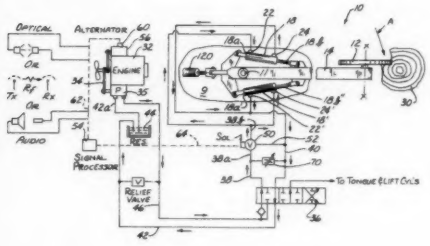
CONTROL SYSTEM FOR STUMP CUTTERS

Philip J. Egging; Brent A. Bartels, and Gary W. Kappel, all of Pella, Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa

Continuation-in-part of application No. 08/770,939, Dec. 19, 1996, Pat. No. 5,845,689, and a continuation-in-part of application No. 08/473,102, Jun. 7, 1995, Pat. No. 5,588,474. This application Dec. 7, 1998, Appl. No. 206,907.

Int. Cl.[7] **A01G** *23/06*

U.S. Cl. 144—334 **42 Claims**



1. A method for operating an engine of a stump cutter, said method comprising:

sensing a condition of a component of a stump cutter having an engine, said condition being a function of a speed of rotation of the engine, said sensing comprises sensing said condition which is a function of the speed of rotation of the engine on a pumping system which is operatively attached to the engine; and

controlling movement of said stump cutter toward a stump based on said function of the speed of rotation of the engine.

6,014,997

RUBBER ARTICLE CONTAINING A REINFORCING YARN OF CELLULOSE

Hanneke Boerstoel, Arnhem, and Marco Ypma, Duiven, both of Netherlands, assignors to Akzo Nobel nv, Arnhem, Netherlands

Division of application No. 08/793,760, Feb. 19, 1997, Pat. No. 5,804,120. This application Jul. 22, 1998, Appl. No. 120,567.

Claims priority, application Netherlands, Aug. 19, 1994, 9401351

Int. Cl.[7] **B60C** *9/00;* **D02G** *3/02;3/44;3/48*

U.S. Cl. 152—151 **2 Claims**

1. A rubber article which can be subjected to mechanical load containing a reinforcing yarn of cellulose wherein said reinforcing yarn is obtained by a process for making cellulose extrudates from an optically anisotropic solution comprising 94–100 wt. % of the following constituents:

Cellulose,

Phosphoric acid and/or its anhydrides, and

Water

by extruding the solution to form extrudates and then coagulating the formed extrudates, said extrudates being aftertreated such that after the after treatment the extrudates have a degree of acidity which at least equals 7.

6,014,998

SILICA-REINFORCED TIRE COMPOSITIONS CONTAINING TRIAZOLES

Syed K. Mowdood, Hudson, Ohio; Ping Zhang, Chelmsford, Mass., and Cristiano Betté, Milan, Italy, assignors to Pirelli Pneumatici S.p.A., Milan, Italy

Filed Jun. 9, 1998, Appl. No. 93,594

Int. Cl.[7] **C08K** *3/34;* **B60C** *11/00;1/00*

U.S. Cl. 152—564 **28 Claims**

1. A method for forming a silica-reinforced rubber composition having improved cure and static and dynamic moduli comprising the steps of:

mixing at least one triazole with silica, a coupling agent and rubber to form a silica reinforced rubber composition.

6,014,999

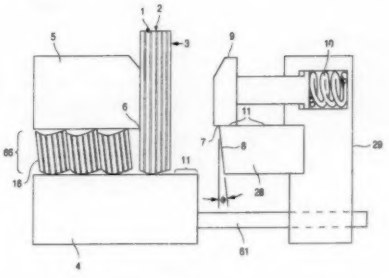
APPARATUS FOR MAKING THERMALLY CONDUCTIVE FILM

James M. Browne, 21 Pillon Reef, Pleasant Hill, Calif. 94523

Division of application No. 08/676,643, Jul. 10, 1996, Pat. No. 5,695,847. This application Jun. 12, 1997, Appl. No. 871,991.

Int. Cl.[7] **B32B** *31/00*

U.S. Cl. 156—512 **7 Claims**



1. An apparatus for making a thermally conductive film from a sheet of composite prepreg material formed of a polymeric matrix material with thermally conductive fibers disposed therein extending lengthwise in a plane of the sheet, the fibers having a greater thermal conductivity than the polymeric matrix material, comprising:

an upper die block and a lower die block separated by a predetermined distance to form an extrusion slot therebetween, said slot having an input opening at one end and an output opening at an opposite end;

a blade dimensioned to intermittently insert into said input opening, wherein when the prepreg is positioned in front of said input opening, the prepreg is sheared to form sheared pieces that are forced into said extrusion slot and merged together to form the film when said blade repetitively enters said input opening; and

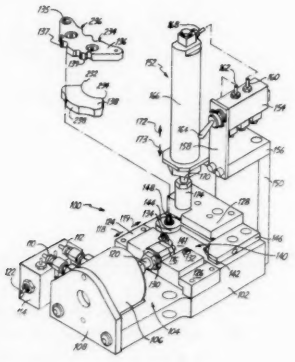
side guides adjacent said input opening, wherein said side guides and said upper and lower die blocks are shaped to introduce the prepreg in front of said input opening at a predetermined angle so that each of said fibers is oriented in said film to form a fiber-to-film surface angle θ relative to top and bottom surfaces of said film that is greater than about 45° but is less than arctan t/d, where t is the thickness of said film and d is the diameter of said fibers in the direction of said angle θ.

6,015,000

METHOD AND APPARATUS FOR MAGNET/BACKIRON BONDING USING SLIP FIT PINS

Terry R. Fahley, Lakeville, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Dec. 3, 1997, Appl. No. 984,377
Int. Cl.[7] H05K *3/00*
U.S. Cl. 156—539 **14 Claims**



1. A bonding apparatus for bonding a magnet to a backiron, the apparatus comprising:

a base surface which supports the magnet in the bonding apparatus while the backiron is supported on the magnet;

a back block connected to the base surface and providing a least one back surface;

a front block having a front surface for pressing the magnet against a back surface and comprising at least one aperture; and

a locating pin slip fit into one of the apertures in the front block and having a portion protruding from the front block, the locating pin for pressing the backiron against a back surface.

6,015,001

TWO TIER VENETIAN BLIND

Ken Tronsgard, and Jocelyn Tronsgard, both of 1252 - 97th Street, North Battleford, Saskatchewan, Canada, S9A 0J7

Filed Aug. 3, 1998, Appl. No. 128,134
Int. Cl.[7] E06B *3/48*
U.S. Cl. 160—115 **5 Claims**

1. A two tier venetian blind comprising:

a blind control mechanism;

an upper tier of slats suspended from said blind control mechanism;

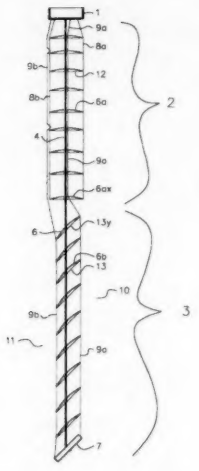
a lower tier of slats suspended from said blind control mechanism below said upper tier of slats;

a front upper control cord and a back upper control cord operatively connected to only said upper tier of slats and to said blind control mechanism for tilting said upper tier of slats;

a front lower control cord and a back lower control cord operatively connected to only said lower tier of slats and to said blind control mechanism for tilting said lower tier of slats; and

a lift cord passing through a lift cord hole in each slat in said upper and lower tiers of slats, said lift cord operatively connected to the blind control mechanism at its top end and attached at its bottom end to the bottom slat in said lower tier of slats such that said blind control mechanism may be operated to draw said lift cord up, thereby raising firstly said lower tier of slats and then said upper tier of slats;

wherein said front lower control cord passes through said lift cord holes in each slat in said upper tier of slats; and



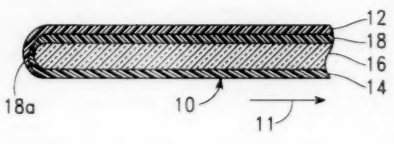
wherein said back lower control cord passes around said back upper control cord at a plurality of points along said back upper control cord.

6,015,002

MULTI-LAYER SLATS FOR VERTICAL AND HORIZONTAL BLINDS

Michael Julius Biro, 4014 NW. 24th Ter., Boca Raton, Fla. 33431, and David Swinscoe, 424 Hendricks Isle, No. 8, Fort Lauderdale, Fla. 33301

Filed Nov. 14, 1997, Appl. No. 970,851
Int. Cl.[7] E06B *9/30*
U.S. Cl. 160—168.1 R **12 Claims**



11. A blind assembly including a plurality of parallel slats, means for pivoting slats within said plurality thereof, and means for varying distances between adjacent slats within said plurality thereof, wherein each slat within said plurality thereof is translucent, and each slat within said plurality thereof comprises:

a translucent inside layer extending along a first external surface of said slat, with said translucent inside layer including components preventing discoloration thereof by ultraviolet light;

a translucent outside layer extending along an external surface of said slat opposite said first external surface thereof, with said translucent outside layer including components preventing discoloration thereof by ultraviolet light; and

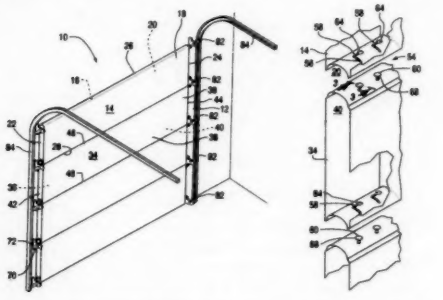
a transparent first base layer extending between said translucent inside layer and said translucent outside layer said translucent inside layer, said translucent outside layer, and said transparent first base layer are coextruded thermoplastic layers.

6,015,003

SECTIONAL OVERHEAD DOOR CONSTRUCTION

Harold Switzgable, 5 Linden La., So., Plainsboro, N.J. 08536

Filed Apr. 23, 1998, Appl. No. 65,381
Int. Cl.[7] E05D *15/06*
U.S. Cl. 160—201 **20 Claims**



1. A sectional overhead door and mounting construction comprising:

A. an articulated panel apparatus including a plurality of sectional door panels, said articulated panel apparatus including:

(1) a first sectional door panel including;

(a) a first exterior member;

(b) a first interior member spatially disposed from said first exterior member and defining a first internal space means therebetween;

(c) a first proximate side member extending between said first exterior member and said first interior member;

(d) a first distal side member extending between said first exterior member and said first interior member at a position spatially disposed from said first proximate side member and further defining said first internal space means therebetween;

(e) a first upper horizontal member extending between said first exterior member and said first interior member and between said first proximate side member and said second distal side member and further defining said first internal space means therebetween;

(f) a first lower horizontal member extending between said first exterior member and said first interior member at a position spatially disposed from said first upper horizontal member;

(2) a second sectional door panel including;

(a) a second exterior member;

(b) a second interior member spatially disposed from said second exterior member and defining a second internal space means therebetween;

(c) a second proximate side member extending between said second exterior member and said second interior member;

(d) a second distal side member extending between said second exterior member and said second interior member at a position spatially disposed from said second proximate side member and further defining said second internal space means therebetween;

(e) a second upper horizontal member extending between said second exterior member and said second interior member and between said second proximate side member and said second distal side member and further defining said second internal space means therebetween;

(f) a second lower horizontal member extending between said second exterior member and said second interior member at a position spatially disposed from said second upper horizontal member;

B. a panel interlocking means operative to engage said first sectional door panel with respect to said second sectional door panel thereadjacent while allowing relative pivotal movement therebetween to facilitate articulated sectional opening and closing thereof, said panel interlocking means comprising:

(1) an engagement slot defined within said first sectional door panel adjacent said second sectional door panel;

(2) an engagement finger mounted to said second sectional door panel and extending outwardly therefrom toward said first sectional door panel thereadjacent and being selectively engageable within said engagement slot of said first sectional door panel to maintain a pivotal interlocking attachment therebetween;

C. an interlocking hinge means positioned adjacent said first sectional door panel and said second sectional door panel for providing pivotal securement therebetween, said interlocking hinge means comprising:

(1) a hinge plate;

(2) a first bracket fixedly mounted to said first sectional door panel;

(3) a second bracket fixedly mounted to said second sectional door panel;

(4) a first pin means attached with respect to said first bracket and said hinge plate to allow relative pivotal movement therebetween to facilitate operation of said interlocking hinge means;

(5) a second pin means attached with respect to said second bracket and said hinge plate to allow relative pivotal movement therebetween to facilitate operation of said interlocking hinge means;

D. a plurality of roller members each rotatably mounted with respect to one of said interlocking hinge means and extending outwardly therefrom away from said articulated panel apparatus; and

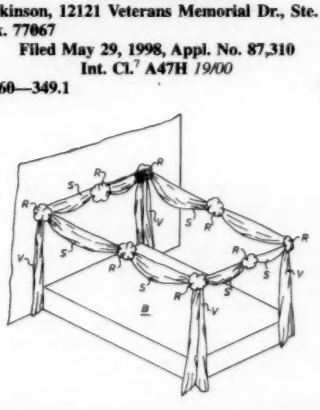
E. a roller guide track adapted to receive said roller members movably retained in position therein to be movable therealong to allow movement of said articulated panel apparatus for facilitating operating of said sectional overhead door construction.

6,015,004

FABRIC SUPPORTING RING FIXTURES FOR CREATING BED CANOPY AND WINDOW DRAPERY ARRANGEMENTS

Greg Harkinson, 12121 Veterans Memorial Dr., Ste. 2, Houston, Tex. 77067

Filed May 29, 1998, Appl. No. 87,310
Int. Cl.[7] A47H *19/00*
U.S. Cl. 160—349.1 **9 Claims**



1. A fabric supporting ring fixture for creating bed canopy and window drapery arrangements, comprising:

a generally flat rectangular mounting plate having front and back surfaces with mounting holes therethrough for receiving fasteners to secure said flat rectangular plate to a flat support surface in a first plane parallel with said support surface;

at least one circular ring element having an outer circumferential portion immovably fixed substantially tangent to said mounting plate front surface and a remaining circumferential portion extending outwardly from said mounting plate front surface alone a second plane generally perpendicular to said first plane; and

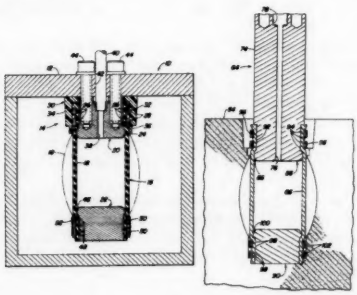
said at least one ring element having a central circular opening sized to pass fabric and drapery materials therethrough and to support portions of said fabric and drapery materials closely adjacent to said flat support surface in decorative arrangements.

6,015,005

RESPECTIVE INFLATABLE ARBORS FOR MAKING BACKDRAFT CAVITY IN SAND CORE AND FOR FORMING PART OF CORE LIFT DEVICE INSERTABLE IN CAVITY

Larry Don Durchenwald, Cedar Falls, Iowa, assignor to Deere Company, Moline, Ill.

Filed Sep. 24, 1997, Appl. No. 936,773
Int. Cl.[7] B22C *9/10;23/00*
U.S. Cl. 164—170 **4 Claims**



1. In a system for preparing a foundry sand core and for handling the sand core thus prepared, said system including tooling for forming at least one cavity in the sand core and a lifting device having at least one expandable arbor shaped for entering said cavity, when not expanded, and gripping the walls of the cavity when inflated, the improvement comprising: said tooling being shaped for forming a cavity having backdraft and said arbor being inflatable and being shaped for easily entering said cavity when deflated and for tightly engaging said cavity having backdraft when inflated while in said cavity to thereby lock the lifting device arbor to the core.

6,015,006

CONTINUOUS CASTING MOULD

Ian Cassels, Sheffield, and James Nicholas Cooper, Huddersfield, both of United Kingdom, assignors to Davy Distington Limited, Sheffield, United Kingdom

PCT No. PCT/GB96/00508, § 371 Date Oct. 23, 1997, § 102(e) Date Oct. 23, 1997, PCT Pub. No. WO96/27466, PCT Pub. Date Sep. 12, 1996
PCT Filed Mar. 6, 1996, Appl. No. 913,019
Claims priority, application United Kingdom, Mar. 7, 1995, 9504528; Jan. 24, 1996, 9601372
Int. Cl.[7] B22D *11/04*
U.S. Cl. 164—416 **16 Claims**

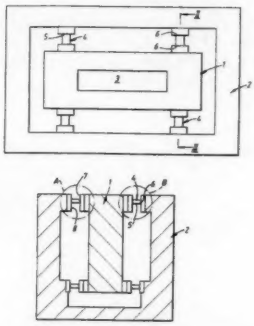
1. A mould assembly assembly for use in the continuous casting of a metal strand comprising

a fixed mould part (**2**);

a movable mould part (**1**, **15**, **16**, **17**, **20**, **26**) which includes means defining the mould passage (**3**);

means for displacing the movable mould part relative to the fixed mould part in a direction which is substantially in the direction of casting;

a plurality of guidance elements (**4**) for guiding the movable mould part relative to the fixed mould part, each element (**4**) having a pair of opposite faces (**6**) which are of arcuate convex from, with one face (**6**) of each said element (**4**) in



engagement with a surface of said fixed mould part (**2**), and with the other face (**6**) of each said element (**4**) in engagement with a surface of said movable mould part (**1**, **15**, **16**, **17**, **20**, **26**); with each of said faces (**6**) of each of said guidance elements (**4**) retained in contact with said surface against which they abut by means (**13**) which permit said guidance elements (**4**) to rock relative to sad surface as said movable mould part is displaced during casting; and

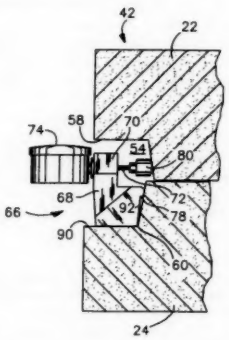
means (**9**, **23**, **24**) for urging said faces (**6**) of each element (**4**) into abutting relation with co-operating surfaces (**7**, **8**) on the fixed and movable mould parts respectively, to allow rocking of the element (**4**) relative to the surfaces.

6,015,007

SAND MOLD SHIFT TESTING METHOD

William A. Hunter, Naples, Fla., and William G. Hunter, North Barrington, Ill., assignors to Hunter Automated Machinery Corporation, Schaumburg, Ill.

Filed Jul. 7, 1998, Appl. No. 111,033
Int. Cl.[7] B22C *9/02*
U.S. Cl. 164—456 **10 Claims**



1. A method for measuring the amount and direction of shift of a cope mold relative to a drag mold, the cope and drag molds having complementary cavities adapted to align when the cope mold is placed atop the drag mold, the method comprising the steps of;

forming cope and drag molds using a matchplate having shift blocks attached to upper and lower surfaces thereof, the shift blocks attached to the upper surface of the matchplate forming cavities in the cope mold, the shift blocks attached to the lower surface of the matchplate forming cavities in the drag mold;

calibrating a gauge mechanism including a gauge block, a spring-biased arm, and a meter adapted to measure movement of the spring-biased arm relative to the meter, the calibrating

step being performed by sliding the gauge block against a gauge standard having prototypical drag and cone mold surfaces such that the spring-biased arm engages the prototypical cope mold surface, the meter being set to zero when the spring-biased arm engages the prototypical cope mold surface to thereby establish a reference point; and

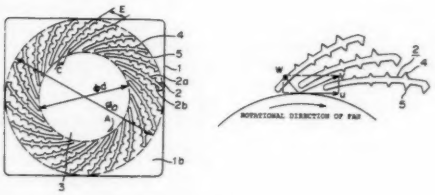
inserting the gauge mechanism into the cavities such that the gauge block engages the drag mold and the spring-biased arm engages the cope mold, the meter measuring the amount of movement of the spring-biased arm relative to the reference point, and thus the amount and direction of the shift of the cope mold relative to the drag mold.

6,015,008

HEAT RADIATING PLATE

Eiji Kogure; Tadashi Fukushima; Hiroaki Tsukahara; Toshihisa Imai; Takao Oshima, all of Hanazono-machi, and Kunihiko Kaga, Tokyo, all of Japan, assignors to Mitsubishi Electric Home Appliance Co., Ltd., Saitama, and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of Japan

Filed Jul. 10, 1998, Appl. No. 113,501
Claims priority, application Japan, Jul. 14, 1997, 9-187997
Int. Cl.[7] H05K *7/20*
U.S. Cl. 165—185 **12 Claims**



1. A heat radiating plate comprising:

a heat transfer plate; and

a plurality of heat radiating fins formed on a surface of the heat transfer plate, wherein

the heat radiating fins are formed in a curved shape and are arranged in a radial pattern on the heat transfer plate,

a space is provided on the surface on the heat transfer plate so as to be surrounded by inward edges of the heat radiating fins,

the heat radiating fins have at least one side wall formed with a plurality of projections,

the projections are formed on inner and outer side walls of the heat radiating fins, and

the projections on the inner side walls are higher than those on the outer side walls in corresponding order.

6,015,009

CASING AND TUBING HANGER SYSTEM

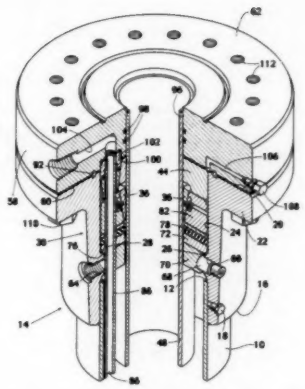
Jack R. Allen, Milam, Tex., assignor to ERC Industries, Houston, Tex.

Filed Feb. 23, 1998, Appl. No. 27,972
Int. Cl.[7] E21B *33/04*
U.S. Cl. 166—89.3 **3 Claims**

1. A hanger system for supporting casing and tubing in a surface pipe anchored in the earth, the surface pipe having an open upper end, the hanger system comprising:

a casing head having a lower tubular portion that telescopically engages an upper end of the surface pipe, the casing head having a vertical opening therethrough and a decreased internal diameter portion providing an internal circumferential load shoulder;

a casing hanger assembly receivable within said casing head vertical opening and having a circumferential load shoulder that seats against said casing head internal load shoulder by which the casing hanger is removably supported within said



casing head, the casing hanger having a vertical casing opening dimensioned to receive casing therethrough, an upper portion of the casing opening having a conically shaped surface and having, exteriorly of the casing opening a vertical tubing opening dimensioned to receive tubing therethrough;

a tubing support plate externally dimensioned to be received in said casing head vertical opening and having a vertical casing opening dimensioned to receive casing therethrough and, exteriorly of the casing opening, a vertical tubing opening dimensioned to receive tubing therethrough, the tubing support plate casing opening and tubing opening being in alignment with said casing and tubing openings in said casing hanger assembly, an upper portion of the tubing support plate tubing opening having a conically shaped surface;

segmented casing slips having a conical external surface removably received in said casing hanger casing opening conically shaped surface and having a central opening therethrough defined by circumferential serrated surfaces configured to engage and support casing positioned in said casing hanger casing opening;

segmented tubing slips having a conical external surface removable received in said tubing support plate conically shaped surface and having a central opening therethrough defined by circumferential serrated surfaces configured to engage and support tubing positioned in said tubing support plate tubing opening; and

a packoff flange having a vertical casing opening dimensioned to sealably receive casing therethrough and having a recess configured to sealable receive the upper end of the tubing and being sealably attachable to said casing head providing for retention of said casing hanger assembly and said tubing support plate within said casing head and having a passageway providing closed communication with the upper end of the tubing supported by said tubing support plate.

6,015,010

DUAL TUBING PUMP FOR STIMULATION OF OIL-BEARING FORMATIONS

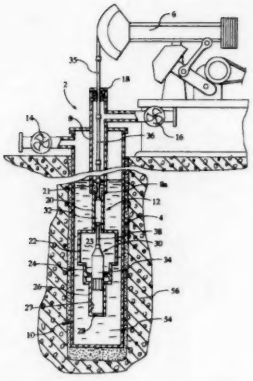
Sergey A. Kostrov, Dallas, Tex., assignor to Applied Seismic Research Corporation, Plano, Tex.

Filed Sep. 10, 1997, Appl. No. 927,032
Int. Cl.[7] E21B *43/25*
U.S. Cl. 166—249 **16 Claims**

1. Apparatus for producing a shock wave in liquid in a borehole, comprising:

(a) a tubing string extending into the borehole;

(b) a cylinder assembly connected with the tubing string, said cylinder assembly containing an elongated internal chamber having an upper bore and a lower bore, said upper bore having a cross-sectional area which is less than the cross-sectional area of the lower bore;



(c) means for positioning said cylinder assembly such that said cylinder assembly is submerged in liquid in the borehole and said internal chamber is filled with liquid;

(d) a plunger assembly including a seal engaging said upper bore and a lower plunger movably arranged within said lower bore and into said internal chamber for compressing a portion of the liquid contained within said internal chamber and discharging the liquid into the borehole when said plunger moves through said lower bore into said internal chamber; and

(e) pumping means connected with said plunger assembly for displacing said plunger assembly within said cylinder assembly.

6,015,011

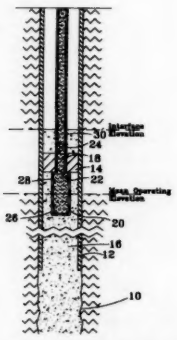
DOWNHOLE HYDROCARBON SEPARATOR AND METHOD

Clifford Wayne Hunter, 339 County Fair, Houston, Tex. 77060

Filed Jun. 30, 1997, Appl. No. 884,756

Int. Cl.[7] E21B *43/08;43/38*

U.S. Cl. 166—265 **9 Claims**



1. An apparatus for separating hydrocarbons from other well fluids downhole in a wellbore extending downwardly from a well surface, comprising:

a body for closing the wellbore to isolate the well fluids below said body from atmospheric pressure at the well surface;

a permeable filter for selectively permitting hydrocarbons below said body to pass through said filter and for selectively restricting other well fluids below said body from passing through said filter wherein the permeability of said filter is adjustable depending on the differential pressure across said filter; and

an aperture through said body for permitting hydrocarbons passing through said filter to move above said body.

6,015,012

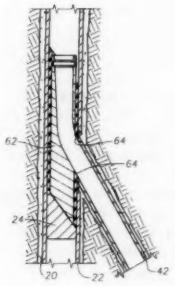
IN-SITU POLYMERIZATION METHOD AND APPARATUS TO SEAL A JUNCTION BETWEEN A LATERAL AND A MAIN WELLBORE

Mark S. Reddick, Houston, Tex., assignor to Camco International Inc., Houston, Tex.

Provisional application No. 60/024,960, Aug. 30, 1996. This application Aug. 29, 1997, Appl. No. 920,994.

Int. Cl.[7] E21B *7/06*

U.S. Cl. 166—313 **26 Claims**



22. In a central wellbore having at least one lateral branch wellbore extending therefrom, the central wellbore having a first casing disposed therein, the first casing having a casing window disposed therein, the lateral branch wellbore having a second casing disposed therein and adjacent the casing window to form a junction between the first and second casings, an improved method of sealing the junction, wherein the improvement comprises the steps of:

installing an in-situ polymerizable sleeve in the first casing adjacent the junction so as to cover the casing window and seal the junction, the sleeve including at least one orienting device for locating the second casing when access is desired thereto, and for selectively directing a well tool into the second casing; and,

milling a window in the in-situ polymerizable sleeve.

6,015,013

LIGHTWEIGHT INTERVENTION SYSTEM FOR USE WITH HORIZONTAL TREE WITH INTERNAL BALL VALVE

Jeffrey Charles Edwards, Aberdeen, and Michael Graham Morgan, Banff, both of United Kingdom, assignors to Expro North Sea Limited, United Kingdom

PCT No. PCT/GB96/01508, § 371 Date May 6, 1998, § 102(e) Date May 6, 1998, PCT Pub. No. WO97/04210, PCT Pub. Date Feb. 6, 1997

PCT Filed Jun. 21, 1996, Appl. No. 983,050

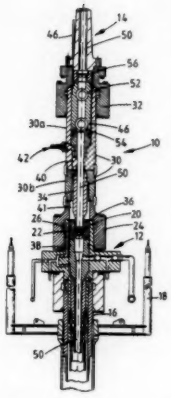
Claims priority, application United Kingdom, Jul. 15, 1995, 9514526

Int. Cl.[7] E21B *7/12*

U.S. Cl. 166—360 **8 Claims**

1. Lightweight intervention apparatus for use with a sub-sea horizontal tree with an internal valve, the horizontal tree having a main bore and a separate annulus bore, the separate annulus bore exiting into an interior of the horizontal tree above the internal valve, said intervention apparatus comprising:

first connection means for connecting the lightweight intervention apparatus to said horizontal tree, housing means coupled to said first connection means, second connection means coupled to said housing means, said second connection means having a quick connect/quick disconnect facility, sub-sea completion test tree means located within said housing means in proximity to said second connection means, said first connection means having an internal annulus line which, when said intervention apparatus is coupled to the horizontal



tree, is to be coupled to a tree annulus line exiting into the interior of said horizontal tree, said annulus line when so coupled being separate from the main bore, said lightweight intervention apparatus including valve operator means connected to said first connection means for coupling to the horizontal tree whereby when the valve operator means is coupled to the tree the internal valve within said tree may be actuated between an open and a closed position by said valve operator means through said lightweight intervention apparatus.

6,015,014

DOWNHOLE LUBRICATOR AND METHOD

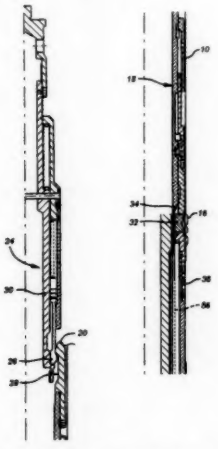
Allan Macleod; Mark McCorry, and Graeme Falconer, all of Aberdeen, United Kingdom, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed May 22, 1997, Appl. No. 862,073

Claims priority, application United Kingdom, May 29, 1996, 9611133

Int. Cl.[7] **E21B** *34/06*

U.S. Cl. 166—374 **25 Claims**



1. A method of performing a downhole operation from the surface and into wellbore tubing of a live well, comprising:

installing at least two fail-closed valves on wellbore tubing;

closing said valves;

pressure-testing each valve to determine that it does not leak;

using the space in the wellbore tubing above said valves to assemble downhole components.

6,015,015

INSULATED AND/OR CONCENTRIC COILED TUBING

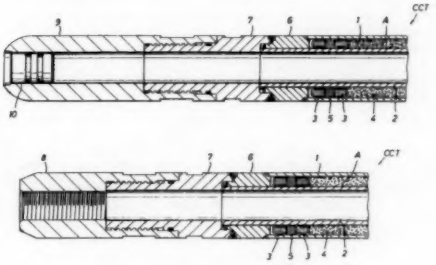
H. Bernie Luft; Graham Wilde, and Peter J. Pelensky, all of Calgary, Canada, assignors to BJ Services Company U.S.A., and Nowsco Well Service Ltd.

PCT No. PCT/US95/12068, § 371 Date Jan. 21, 1997, § 102(e) Date Jan. 21, 1997, PCT Pub. No. WO97/01017, PCT Pub. Date Jan. 9, 1997

PCT Filed Sep. 21, 1995, Appl. No. 564,357

Int. Cl.[7] **E21B** *23/08*

U.S. Cl. 166—384 **71 Claims**



1. A coiled tubing composite, comprising:

an inner coiled tubing positioned within an outer coiled tubing defining an annulus therebetween; and

a plurality of centralizers longitudinally spaced within said annulus between said inner and outer tubing at multiple intervals along the length of the composite;

wherein said composite exhibits sufficient flexibility for reeling on a truckable spool and sufficient stiffness for injecting in a bore.

6,015,016

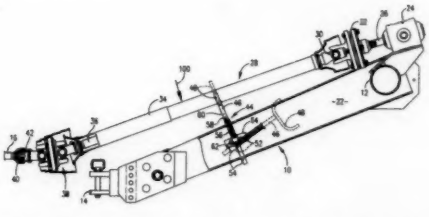
STOWABLE DRIVELINE CONNECTION AID FOR POWER-DRIVEN FARM IMPLEMENTS

J. Dale Anderson, Canton, and Don Fuqua, Hesston, both of Kans., assignors to Hay & Forage Industries, Hesston, Kans.

Filed Jul. 21, 1997, Appl. No. 897,471

Int. Cl.[7] **A01B** *59/00*

U.S. Cl. 172—677 **18 Claims**



1. In combination with a farm implement having a mobile frame including a fore-and-aft tongue for hitching the implement to a towing tractor having a power takeoff shaft, the implement further having a driveline extending along and above the tongue for transferring driving power from the power takeoff shaft to operating components on the frame when the driveline is connected with the power takeoff shaft, a combination support stand and manual connection aid for the driveline comprising:

a support for the driveline;

mounting structure coupling said support with the tongue for selective manual positioning of the support in either a stowed position down out of engagement with the driveline when the driveline is connected to and supported by the power takeoff shaft or a use position up in engagement with the driveline when the driveline is disconnected from and unsupported by the power takeoff shaft,

said support being disposed to be aligned laterally with the power takeoff shaft when the support is in its use position for supporting the driveline in lateral alignment with the power takeoff shaft during manual re-connection of the driveline to the power takeoff shaft,

said support being extendible relative to said mounting structure; and

a spring operably associated with said support for yieldably extending the support relative to the mounting structure such that the support carries the driveline in lateral alignment with the power takeoff shaft during re-connection of the driveline to the power takeoff shaft and yieldably supports the load of the driveline.

6,015,017

ROTARY HAMMER

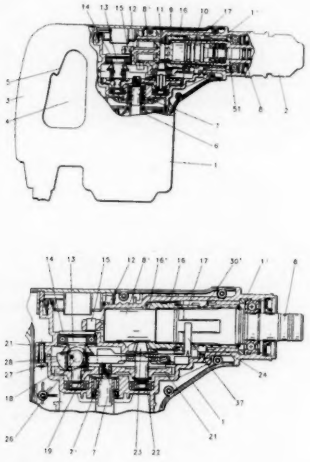
Martin Lauterwald, Frankfurt, Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 15, 1998, Appl. No. 60,395

Claims priority, application Germany, Apr. 18, 1997, 197 17 712

Int. Cl.[7] B23B *45/02*

U.S. Cl. 173—48 **9 Claims**



1. A rotary hammer comprising:

a hammer housing having front and rear ends;

a hammer spindle rotatably mounted in the housing for rotation about an axis;

a drive sleeve rotatably mounted on the hammer spindle;

a coupling sleeve is non-rotatable but axially displaceably mounted on the hammer spindle to rotate therwith and couplable to the drive sleeve;

a motor having an armature shaft extending perpendicular to the hammer spindle axis;

a tool holder for receiving a bit, the holder located at the front end of the hammer housing and rotatably drivable by the motor about the hammer spindle axis;

a hammer mechanism in the hammer housing for generating impacts acting on a rear end of the bit and having a drive shaft;

the armature shaft being selectively coupled with the hammer mechanism drive shaft for generating impacts and being selectively coupled with the coupling sleeve via the drive sleeve for driving the hammer spindle;

a switching element rotatable about a main axis and having a cam section for switching between at least a first pure drilling mode, a second hammer drilling mode and a third chiseling mode;

a slider part movable parallel to the axis of the hammer spindle;

the cam section acting on the coupling sleeve via the slider part to move the coupling sleeve between a position engaged with the drive sleeve and a release position separated from the drive sleeve;

a coupling part coaxially movable relative to the drive shaft between a first and second position engaging and disengaging, respectively, a drive connection between the armature shaft and the drive shaft; and

an actuating section connected to the switching element eccentrically relative to the main axis for moving the coupling part between the first and second positions.

6,015,018

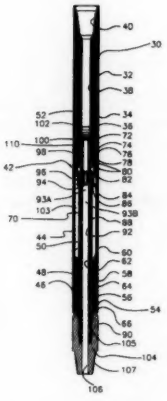
METHOD AND APPARATUS FOR MOVING A PISTON

Michael J. Gazewood, 402 Machine Loop, Scott, La. 70583

Filed Aug. 13, 1997, Appl. No. 910,432

Int. Cl.[7] E21B *7/08*

U.S. Cl. 175—57 **18 Claims**



1. A method for moving a piston comprising the steps of:

providing a housing having an inner and outer diameter, with said piston being slidably received within said inner diameter of said housing and forming a chamber and a first shoulder and a second shoulder, said piston having attached thereon a venturi means for creating a zone of low pressure, and wherein said venturi means contains a nozzle member and a first passageway means for communicating the chamber with the nozzle member;

circulating a fluid through the inner diameter of said housing;

funneling the fluid through said venturi means;

exiting the fluid out of said nozzle member;

creating a zone of low pressure about said nozzle member;

evacuating the fluid in said chamber via said first passageway means;

urging said piston continuously downward relative to said housing during said circulating of the fluid through the inner diameter of said housing;

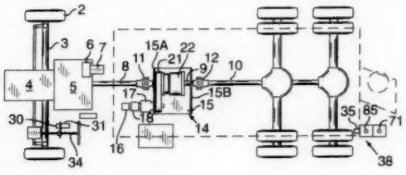
forcing the fluid on said second shoulder of said piston;

urging said piston continuously downward relative to said housing.

6,015,019
AUXILIARY DRIVE AND STEERING SYSTEM FOR A VEHICLE

Lahon H. Grimes; Karl V. Grimes, both of Springfield, and James E. Yelton, Eugene, all of Oreg., assignors to Chassis Remote, Inc., Springfield, Oreg.

Filed May 8, 1998, Appl. No. 74,949
Int. Cl.[7] B60K *25/00*
U.S. Cl. 180—53.2 **11 Claims**



1. In a vehicle of the type having a cab for an operator of the vehicle; a vehicle engine; a vehicle transmission connected to the vehicle driveline; a vehicle steering system with components including steering column and steerable wheels; a vehicle air brake system; and a power take-off engageable with the transmission, the improvement comprising,

a hydraulic pump powered by the vehicle power takeoff,

an auxiliary drive assembly offset from the ends of said driveline for powering the driveline during remote operation of the vehicle and including a fixed displacement bi-directional hydraulic motor with inlet and outlet ports driven by said pump and having an output shaft, a brake engageable with the motor output shaft, a gear reduction unit driven by said output shaft, a clutch including plate members one of said members connected to the driveline, power transmission means coupling said gear reduction unit with said clutch,

a control circuit for said hydraulic motor and including a first directional valve, a counterbalance valve of the auxiliary drive assembly including piloted counterbalancing valves jointly served by said first directional valve, a torque relief valve in communciation with the inlet and outlet ports of said motor and openable to equalize fluid pressure between said ports to dissipate torque from said motor output shaft, a brake release valve in communciation with said brake of the auxiliary drive assembly, said first directional valve of the solenoid type and proportionally responsive to control signals,

a vehicle operator's station remote from the vehicle cab,

an auxiliary steering system for rotation of the vehicle steering column and served by said hydraulic pump and including a second directional valve and having an output shaft, a clutch engageable with said output shaft and power transmission means coupling said clutch with the vehicle steering column, said second directional valve being of the proportional type, and

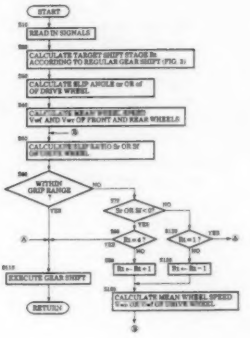
control means located at the operator's station for transmitting signals to said first and second directional valves for regulating flows from said valves in proportion to the signals received to control the speed and direction of the vehicle.

6,015,020
GEAR SHIFT CONTROL DEVICE OF AUTOMATIC TRANSMISSION FOR VARIABLE STAGE UPSHIFT AGAINST WHEEL SLIP

Mizuho Sugiyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 31, 1997, Appl. No. 825,623
Claims priority, application Japan, May 10, 1996, 8-141089
This patent is subject to a terminal disclaimer.
Int. Cl.[7] G06G *7/70*
U.S. Cl. 180—197 **3 Claims**

1. A gear shift control device of an automatic transmission of a vehicle having a pair of drive wheels and a pair of driven wheels, comprising:


START
READ IN SIGNALS
CALCULATE TARGET SHIFT STAGE Sn ACCORDING TO REGULAR GEAR SHIFT (FIG. 3)
CALCULATE SLIP ANGLE αr OR αf OF DRIVE WHEEL
CALCULATE MEAN WHEEL SPEED Vwf AND Vwr OF FRONT AND REAR WHEELS
CALCULATE SLIP RATIO Sr OR Sf OF DRIVE WHEEL
WITHIN GRIP RANGE
Sr OR Sf < 0?
Sn < 4?
Sn > 1?
Sn ← Sn + 1
Sn ← Sn - 1
EXECUTE GEAR SHIFT
CALCULATE MEAN WHEEL SPEED
RETURN

a means for estimating slip angle of at least one of the pair of drive wheels;

a means for estimating slip ratio of said at least one drive wheel;

a means for determining an upshift of the automatic transmission when the absolute value of said estimated slip ratio is greater than a threshold value; and

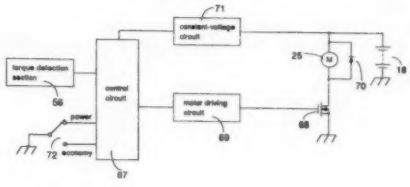
a means for executing upshift of the automatic transmission according to said upshift determined by said upshift determination means;

wherein said upshift determination means determines said upshift to be of a greater number of stage within an available range against the absolute value of said estimated slip ratio according as the absolute value of said estimated slip angle is greater.

6,015,021
ELECTRICALLY ASSISTED VEHICLE

Tatsuaki Tanaka, Kasai; Toshihiro Suhara, Taka-gun; Toshihiro Matsumoto, Kasai; Hiroaki Sagara, Kasai, and Yoshihiko Maeda, Kasai, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Aug. 19, 1997, Appl. No. 918,592
Claims priority, application Japan, Aug. 28, 1996, 8-226762
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B62K *11/00*
U.S. Cl. 180—206 **14 Claims**



1. An electrically assisted vehicle comprising:

a vehicle body having a driving wheel driven by human driving power and electric driving power;

a driving power applying section for applying the human driving power to drive the driving wheel;

a torque detection section to detect the human driving power applied to the driving power applying section;

a motor to auxiliarily drive the driving wheel by the electric driving power;

a battery to supply power for the motor; and

a control section to control the motor according to a result detected by the torque detection section,

wherein the control section has a plurality of switchable assist modes relating to an assist ratio of the electric driving power to the human driving power.

6,015,022

ULTRA-LIGHT ROAD VEHICLE

Jean-Luc Thuliez, Montagu 30/ CH-2520, La Neuveville, Switzerland

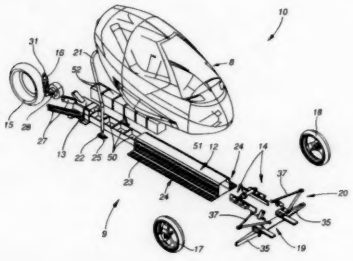
PCT No. PCT/CH96/00371, § 371 Date May 29, 1998, § 102(e) Date May 29, 1998, PCT Pub. No. WO97/15484, PCT Pub. Date May 1, 1997

PCT Filed Oct. 22, 1996, Appl. No. 43,099

Claims priority, application France, Oct. 23, 1995, 95 12951

Int. Cl.[7] **B62D** *61/06*

U.S. Cl. 180—210 **25 Claims**



1. An ultra-light road vehicle comprising only a small number of components, specifically a vehicle of the type known as a "city car" for commuting use, in particular electrically propelled, comprising a supporting structure, two front wheels and one rear wheel mounted by suspensions on this supporting structure and a separate passenger compartment fitted on to the supporting structure, the supporting structure comprising a hollow central beam, characterized by the fact that this hollow central beam (**12**) is constituted from extruded section of lightweight material of constant cross-section, that the two front wheels (**17**, **18**) provide the steering and the rear wheel (**15**) provides the propulsion and lies approximately on the axis of the aforementioned hollow central beam (**12**), that the propulsion motor (**28**) and energy storage are housed inside the hollow central beam (**12**), and that the separate passenger compartment is fixed as a unit to the hollow central beam (**12**).

6,015,023

ELECTRIC POWER STEERING APPARATUS

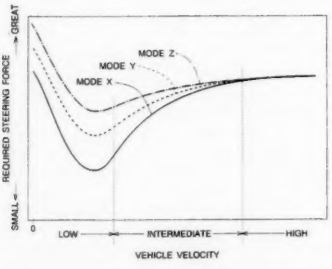
Yoshinobu Mukai, and Yoshiki Noro, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1998, Appl. No. 74,832

Claims priority, application Japan, Jun. 26, 1997, 9-170531

Int. Cl.[7] **B62D** *5/04*

U.S. Cl. 180—446 **2 Claims**



1. An electric power steering apparatus for an automotive vehicle comprising:

an electric motor for applying an electric steering assist to a steering system of the automotive vehicle;

a steering torque sensor for detecting steering torque manually applied to the steering system;

a control unit for setting a target current corresponding at least to the steering torque detected by said steering torque sensor; and

a drive for driving said electric motor on the basis of a motor control signal generated by said control unit,

wherein said control unit includes a plurality of assist mode generators to which are allocated different characteristics of the target current, any one of the assist mode generators can be switchably selected depending on a predetermined condition, and all of said assist mode generators are set in such a manner that the respective characteristics of the target current become substantially uniform in a high-velocity drive of the automotive vehicle.

6,015,024

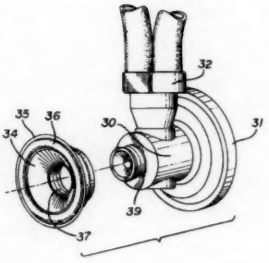
STETHOSCOPE HEAD WITH REMOVABLE BELLS

Richard Rashman, Los Angeles, and Dennis Shick, Burbank, both of Calif., assignors to Prestige Medical Corporation, Northridge, Calif.

Filed Oct. 31, 1997, Appl. No. 962,338

Int. Cl.[7] **A61B** *7/02*

U.S. Cl. 181—131 **17 Claims**



1. A stethoscope head for detecting sounds, comprising:

a chest piece having ends; one end adapted to receive one bell component selected from a plurality of bell components, said bell component selected according to an area to be auscultated;

a valve stem having ends, disposed partially within said chest piece, so that one end of said valve stem is within said chest piece and at least one portion of said valve stem protrudes from said chest piece, each end of said valve stem in communication with the other end of said valve stem to transmit sound;

said bell component for receiving sound coupled to one end of said chest piece and in communication with said valve stem within said chest piece, said bell component having a body and a rim; and

a non-metallic ring disposed on said rim, said non-metallic ring protruding from said bell component.

6,015,025

DIFFUSER PANEL WITH BUILT-IN SPEAKER ARRANGEMENT AND METHODS OF INSTALLATION

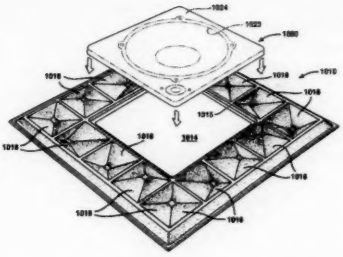
Ralph D. McGrath, and Harry A. Alter, both of Granville, Ohio, assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation-in-part of application No. 09/003,539, Jan. 6, 1998, which is a continuation-in-part of application No. 08/969,132, Nov. 12, 1997, Pat. No. 5,923,002, which is a continuation-in-part of application No. 08/871,021, Jun. 6, 1997. This application Sep. 4, 1998, Appl. No. 146,902.

Int. Cl.[7] **A47B** *81/06*

U.S. Cl. 181—199 **19 Claims**

1. Apparatus for supporting at least one speaker that has a sound emitting surface, said apparatus comprising:



a diffuser panel having a non-planar diffusing surface having a plurality of diffuser members therein, each said diffuser member having a cross-sectional shape and wherein said cross-sectional shape of at least one said diffuser member differs from said cross-sectional shape of at least one other said diffuser member; and

an opening therethrough corresponding to each speaker for receiving at least a portion of the corresponding speaker therein such that the diffuser panel does not substantially cover the sound emitting surface of the corresponding speaker.

6,015,026

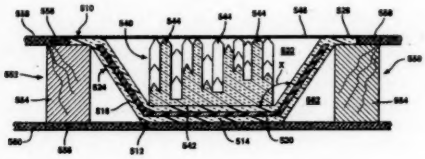
ACOUSTICAL DIFFUSER ASSEMBLY AND METHOD OF INSTALLATION

Ralph D. McGrath, Granville, Ohio, assignor to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation-in-part of application No. 08/969,132, Nov. 12, 1997, Pat. No. 5,923,002, which is a continuation-in-part of application No. 08/871,021, Jun. 6, 1997. This application Jan. 6, 1998, Appl. No. 3,539.

Int. Cl.[7] **E04B** *1/82*

U.S. Cl. 181—295 **21 Claims**



1. Apparatus for supporting an acoustical diffuser panel within a structure, said apparatus comprising a rigid support member fabricated from an acoustically absorptive material, said support member having a bottom and upstanding side walls defining a well sized to receive said diffuser panel therein and an asphalt septum encapsulated within said support member to receive said diffuser panel therein.

6,015,027

ESCAPE LADDER ASSEMBLY

Frank Banks, 47 N Downs Crescent, New Addington, Croydon, Surrey CR0 0LG, United Kingdom

Filed May 6, 1999, Appl. No. 307,351

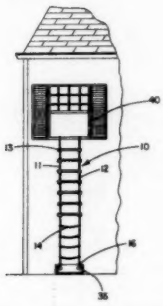
Int. Cl.[7] **E06B** *1/06*

U.S. Cl. 182—70 **6 Claims**

1. An escape ladder assembly, comprising:

a ladder comprising a spaced apart pair of elongate flexible members and a plurality of steps extending between said flexible members of said ladder;

each of said flexible members having opposite upper and lower ends;



a storage box having an opening therein and a lid substantially covering said opening of said storage box, said lid being detachably coupled to said storage box;

said ladder being disposed in said storage box; and

said upper ends of said flexible member of said ladder being coupled to said storage box, said bottom ends of said flexible member being coupled to said lid wherein said plurality of steps comprises a plurality of rigid steps and a plurality of flexible steps, wherein said rigid steps are arranged in a row extending along said flexible members positioned towards said upper ends of said flexible members, and wherein said flexible steps are arranged along said flexible members in a row extending along said flexible members between said row of rigid steps and said lower ends of said flexible members.

6,015,028

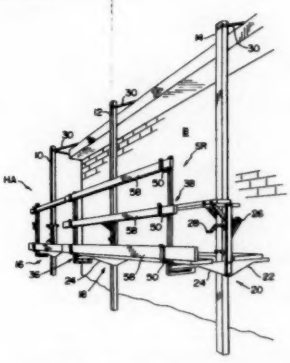
PUMP JACK HOISTING APPARATUS INCLUDING A SAFETY RAILING FOR PROTECTING WORKERS FROM ACCIDENTAL FALLING

Andrew C. Smith, 1541 Park Rd., Harrisonburg, Va. 22801

Filed May 14, 1997, Appl. No. 855,957

Int. Cl.[7] **E04G** *1/18*

U.S. Cl. 182—136 **7 Claims**



1. A pump jack hoisting apparatus for use in connection with low-rise and residential constructions and buildings including a safety railing for protecting workers from accidental falling, comprising:

a) a pair of laterally spaced pump jack poles each including a brace adjacent one end thereof for securing to a building or construction;

b) a pair of pump jacks each operably associated with the respective jack pole of said pair of jack poles;

c) each of said pump jacks including inner and outer support extensions;

d) inner and outer walking platforms spanning between said pair of pump jacks and supported on respective inner and outer support extensions thereof;

e) said inner and outer platforms extending in a generally common plane;

f) a pair of generally L-shaped support frames each removably secured to said outer support extension of said respective pair of pump jacks;

g) each of said pair of a generally L-shaped support frames including a vertically extending arm and a horizontally extending brace;

h) each said horizontally extending brace including an upwardly extending mounting projection member engaging the outer support extension of said respective pump jack means for locking each of said pair of generally L-shaped support frames to respective outer support extensions, said means for locking comprising lock pins releasably locking the projection members to respective outer support extensions, and a catch member on each vertically extending arm engaging a flange on respective outer support extensions;

i) first, second and third vertically equidistantly spaced rail brackets mounted on each of said arms;

j) each of said rail brackets being generally L-shaped and including a top-open recess;

k) said rail brackets being vertically spaced on each of said respective vertically extending arms;

l) a rail removably positioned in said recess and extending between said pair of a generally L-shaped support frames;

m) each of said vertically extending arms including a first side facing said brace and a second side facing away therefrom; and

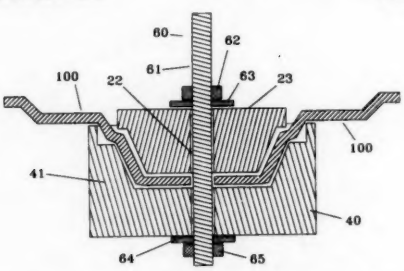
n) said rail brackets being mounted on said second side of said arms vertically extending.

6,015,029

METHOD AND APPARATUS FOR TRANSMISSION DRAIN INSTALLATION

Mark A. Maxwell, 2224 Noble Ct. SE. #C, Auburn, Wash. 98092

Filed Aug. 4, 1998, Appl. No. 130,033
Int. Cl.[7] F16N *31/00*
U.S. Cl. 184—106 **1 Claim**



1. A method for installing a drain in a transmission fluid pan, **24** comprising:

(A) drilling a non-threaded hole in the transmission fluid pan;

(B) placing an upper deformation plate defining a lower surface having a modified convex configuration sized to form a depression in a transmission fluid pan on an upper surface of the transmission fluid pan, whereby a bolt passage through the upper deformation plate is positioned over the hole in the transmission pan;

(C) placing a lower deformation plate defining an upper surface having a modified concave configuration sized to substantially enclose the lower surface of the upper deformation plate on a lower side of the transmission pan, whereby a bolt passage through the lower deformation plate is positioned under the hole in the transmission fluid pan;

(D) passing a stud through the bolt passage in the upper deformation plate, the hole in the transmission fluid pan and through the bolt passage in the lower deformation plate;

(E) attaching nuts to each end of the threaded stud;

(F) applying torque to at least one of the nuts, whereby the upper and lower deformation plates are drawn together, thereby deforming the transmission fluid pan, which is bent to conform to the space between the upper and lower deformation plates;

(G) removing the deformation plates and threaded stud;

(H) passing a hollow bolt having a smooth interior passage, through the hole in the transmission fluid pan, and into a position wherein an upper end of the hollow bolt is located above the upper side of the transmission fluid pan and a threaded lower end of the hollow bolt is located below the lower side of the transmission fluid pan;

(I) fastening upper and lower washers and nuts on both sides of the hollow bolt, thereby securing the hollow bolt in position in a fluid-tight manner; and

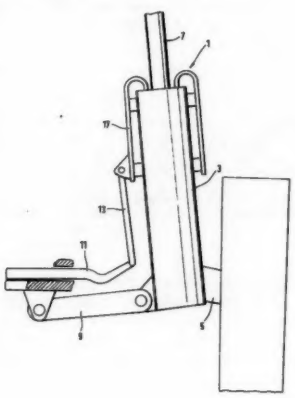
(J) attaching an internally threaded end cap to the threaded lower end of the hollow bolt, whereby the end cap may be removed, allowing transmission fluid drainage.

6,015,030

VIBRATION DAMPER WITH VARIABLE DAMPING FORCE

Manfred Grundei, Niederwerrn, Germany, assignor to Mannesmann Sachs AG, Schweinfurt, Germany

Filed Sep. 5, 1997, Appl. No. 924,377
Claims priority, application Germany, Sep. 12, 1996, 196 37 095
Int. Cl.[7] B60G *11/26*
U.S. Cl. 188—266.2 **8 Claims**



1. A vibration damper with variable damping force, comprising:

a cylinder;

a piston and a piston rod arranged in the cylinder so as to be axially movable;

an adjustable damping valve connected between the cylinder and the piston rod, and controlled as a function of a spring deflection path;

a stabilizer operatively connected to the adjustable damping valve so as to control the adjustable damping valve;

additional damping valves arranged to have a damping effect independent from the control by the stabilizer;

a tension rod connected to the stabilizer; and

a transmission member connected between the tension rod and the adjustable damping valve.

6,015,031

ACTUATING DRIVE WITH VALVE UNITS FOR ACTUATING A FRICTION CLUTCH AND AN AUTOMATED SHIFT TRANSMISSION

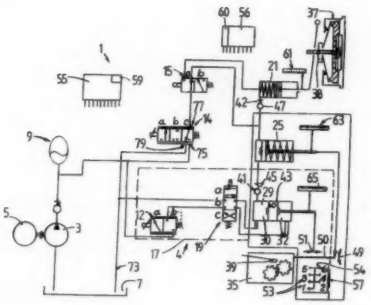
Jens Dorfschmid, Notzingen; Thomas John, Sulzheim, and Robert Seufert, Oerlenbach, all of Germany, assignors to Mannesmann Sachs AG, Schweinfurt, Germany

Filed May 13, 1998, Appl. No. 78,114

Claims priority, application Germany, May 15, 1997, 197 20 302; Oct. 10, 1997, 197 44 758; Apr. 8, 1998, 198 15 666

Int. Cl.[7] B06K *41/22*

U.S. Cl. 192—3.58 **14 Claims**



1. An actuating drive for automated actuation of a friction clutch, comprising:

actuator means for automated engagement and disengagement of the friction clutch;

control means, to which signals characterizing an operating state are fed, for controlling the actuator means for the engagement and disengagement of the friction clutch as a function of the signals;

a sensor system which picks up signals characterizing a gradient of a transmission input shaft speed, the control means receiving signals from the sensor system, whereby, starting from a position in which the friction clutch is at least partly disengaged by the actuator means, an engagement rate of the friction clutch by means of the actuator means is predeterminable as a function of the gradient of the transmission input shaft speed, individual gears of a transmission being assigned synchronization points which, when a respective gear is selected, are detectable via the gradient of the transmission input shaft speed that results from synchronization operation; and

a gear selection device and actuating cylinder means for actuating a gear selection in the transmission, one of the gear selection device and the actuating cylinder means being driven in a gear selection direction as a function of the gradient of the transmission input shaft speed.

6,015,032

DRIVE WITH SELF-ACTUATING CLUTCH AND BRAKE

John D. McGourthy, Jr., Mequon, and Jon A. DeBoer, Jr., Port Washington, both of Wis., assignors to John D. McGourthy, Sr., Mequon, Wis.

Filed Sep. 11, 1997, Appl. No. 927,297

Int. Cl.[7] F16D *13/76*

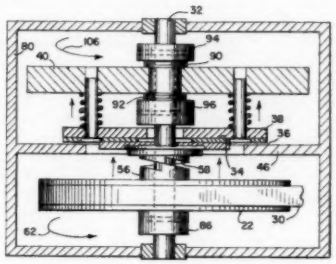
U.S. Cl. 192—14 **4 Claims**

1. A drive mechanism comprising:

a driving rotary member;

a driven rotary member;

a clutch operatively coupled between said driving member and said driven member and responsive to rotation of said driving member to automatically engage and rotate said driven member after a given amount of rotation of said driving member,



wherein said driving member and said driven member are axially spaced, and said clutch comprises an axially movable clutch face having a released position axially spaced from said driven member, and having a driving position engaging said driven member, said clutch face being axially moved from said released position to said driving position by rotation of said driving member,

an arcuate camming surface between said driving member and said clutch face such that rotation of said driving member axially cams said clutch face toward and into engagement with said driven member,

wherein said cam surface comprises a release lobe at a high point, such that said camming surface cams said clutch face into engagement with and rotates said driven member before said lobe is reached, but if said driven member is stopped by a foreign object, said driving member may continue to rotate until said lobe is reached, whereafter said clutch face may move axially away from said driven member, whereby to protect a motive member driving said driving member.

6,015,033

DYNAMIC DAMPER AND FLYWHEEL ASSEMBLY

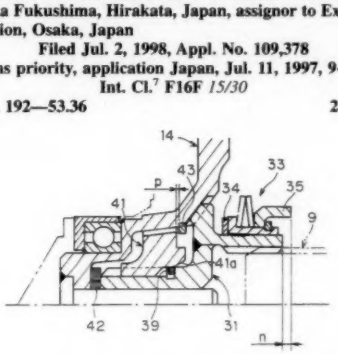
Hirotaka Fukushima, Hirakata, Japan, assignor to Exedy Corporation, Osaka, Japan

Filed Jul. 2, 1998, Appl. No. 109,378

Claims priority, application Japan, Jul. 11, 1997, 9-186760

Int. Cl.[7] F16F *15/30*

U.S. Cl. 192—53.36 **29 Claims**



1. A dynamic damper assembly adapted to be employed in a coupling mechanism including a main clutch coupled between a crankshaft of an engine and an input shaft of a transmission, and adapted to rotate with the input shaft of the transmission, said dynamic damper assembly comprising:

a mass portion adapted to rotate with the input shaft of the transmission;

a two stage sub-clutch having a first part coupled to said mass portion and a second part adapted to be non-rotatably coupled to the input shaft of the transmission, said sub-clutch having a partially engaged position, in which said first and second parts are partially coupled together such that said mass portion rotates at a speed close to a speed of the input shaft when said main clutch disengages the crankshaft of the engine from the input shaft of the transmission, and a fully engaged position, in which said first and second parts are fully coupled together

such that said mass portion is adapted to be rotated together with the input shaft when said main clutch engages the crankshaft of the engine to the input shaft of the transmission; and

an elastic portion operatively coupled to said mass portion and adapted to elastically couple the input shaft of the transmission and said mass portion in the rotating direction when the input shaft of the transmission and said mass portion are interlocked together by said sub-clutch.

6,015,034

WARP BEAM COUPLING

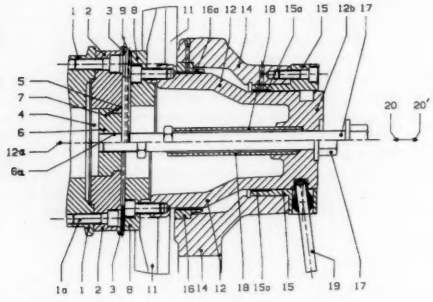
Fritz Rupflin, Sorgersweg, Germany, assignor to Lindauer Dornier, Lindau, Germany

Filed May 26, 1998, Appl. No. 84,058

Claims priority, application Germany, Jun. 7, 1997, 197 24 150

Int. Cl.[7] F16D *11/10;* **D03D** *49/06*

U.S. Cl. 192—69.8 **22 Claims**



1. Warp beam coupling for weaving looms, having a bearing bell which is rotatingly driven by a warp beam drive and is disposed in a warp beam bearing and which has a coupling flange which can be connected with a coupling flange situated on a warp beam tube of a warp beam,

wherein the coupling flanges are each provided with a serration,

wherein an adjusting device is provided on the bearing bell to selectively engage and disengage the serration of the coupling flange of the bearing bell and the serration of the coupling flange of the warp beam tube, and

wherein the bearing bell also accommodates tensioning devices for bracing the coupling flanges which are engaging with one another.

6,015,035

CLUTCH DISK

Hiroshi Mizukami, Neyagawa, Japan, assignor to EXEDY Corporation, Neyagawa, Japan

Filed Nov. 24, 1998, Appl. No. 198,278

Claims priority, application Japan, Dec. 3, 1997, 9-333015; Dec. 3, 1997, 9-333016

Int. Cl.[7] F16D *13/50*

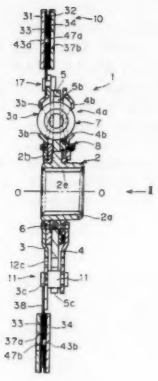
U.S. Cl. 192—107 C **10 Claims**

1. A clutch disk for use in a clutch disk assembly for engagement and disengagement with a flywheel, said clutch disk comprising:

first and second friction members;

first and second core plates, said first core plate being fixed to said first annular friction member and said second core plate being fixed to said second annular friction member;

a cushioning plate having first and second cushioning portions disposed between said first and second annular friction members, said first and second cushioning portions being axially



offset with respect to one another and with respect to the clutch disk assembly;

wherein at least one of said first and second core plates is formed unitarily with at least one engagement portion which engages one of said first and second cushioning portions, and

at least one of said first and second cushioning portions is provided with an aperture, and said engagement portion is a projection which extends through said aperture and said engagement portion is caulked into engagement about said aperture.

6,015,036

ELECTRICAL SHIFT CONTROL DEVICE FOR A BICYCLE TRANSMISSION

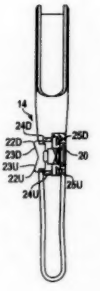
Masahiko Fukuda, Amagasaki, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Jan. 8, 1998, Appl. No. 4,615

Claims priority, application Japan, Jan. 4, 1997, 9-017301

Int. Cl.[7] B62M *25/08*

U.S. Cl. 192—217 **18 Claims**



15. An electrical shift control device for a bicycle transmission comprising:

a brake lever adapted to move relative to a handlebar;

a first electrical shift control switch mounted to the brake lever; and

wherein the first electrical shift control switch includes a first finger contacting surface that extends laterally outwardly from a lateral side of the brake lever.

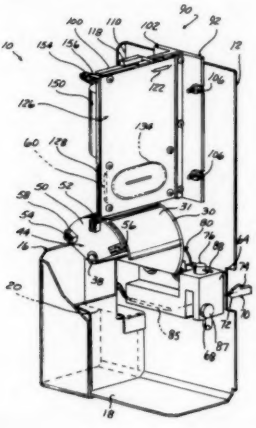
6,015,037
COIN IDENTIFICATION APPARATUS

Donald R. Bernier, Rochester; Stephen G. Fraser, Troy, and Richard O. Juengel, Romeo, all of Mich., assignors to Compunetics, Inc., Troy, Mich.

Division of application No. 08/682,118, Jul. 17, 1996, Pat. No. 5,799,768. This application Jan. 28, 1998, Appl. No. 14,462.

Int. Cl.[7] G07D *5/08*

U.S. Cl. 194—318 **7 Claims**



1. A coin identification apparatus usable in an enclosure having a closure movable between a first position closing access to the interior of the enclosure and a second position spaced from the first position allowing access to the interior of the enclosure, the coin identification apparatus comprising:

a latch mounted on the closure;

the coin identification apparatus having a slot sized to slidably receive the latch therein, the coin identification apparatus carried on the enclosure for receiving the latch in the slot when the closure is in the first position;

a latch pin releasibly engagable with the latch when the closure is in the first position, the latch pin mounted in a bore in a housing, the slot formed in the housing, the bore intersecting the slot; and

means for moving the latch pin between a first position engagable with the latch to latch the closure in the first position and a second position spaced from the first position enabling movement of the latch and the closure from the first position to the second position.

6,015,038
HANDRAIL MONITORING SYSTEM

Oliver Stöxen, Seelze, and Martin Mehlert, Nienstaedt, both of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Dec. 19, 1995, Appl. No. 574,792

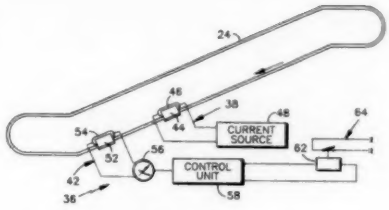
Int. Cl.[7] B65G *43/00*

U.S. Cl. 198—322 **13 Claims**

1. A handrail monitoring device for a handrail, the handrail being driven through a closed loop by a drive machine, the monitoring device including:

one or more conductors extending through the handrail;

means for inducing an electrical current in the one or more conductors; and



means to monitor the induced current.

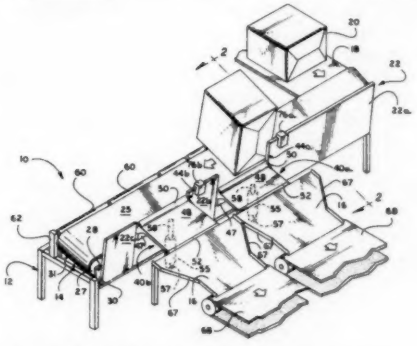
6,015,039
HIGH SPEED TILTED BELT SORTER

Henri Bonnet, Atlanta, Ga., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Filed Feb. 4, 1997, Appl. No. 795,707

Int. Cl.[7] B65G *37/00;47/46*

U.S. Cl. 198—368 **31 Claims**



1. An article transferring apparatus, comprising:

a longitudinally extending conveyor disposed with its transverse dimension angled from an upper edge to a lower edge;

a barrier extending along said lower edge, whereby articles on said conveyor are prevented from sliding off said angled conveyor;

at least one gate positioned in said barrier;

active means for drawing an article engaging said means away from said conveyor;

an actuator operatively connected to said gate for selectively removing said gate from said barrier to a position which allows an article on said conveyor to slide into engagement with said active means.

6,015,040
TRANSFER DEVICE

Claude Goeb, Ostwald, France, and Karl-Heinz Süss, Graben-Neudorf, Germany, assignors to Maschinenfabrik Polytype S..A., Fribourg, Switzerland

Filed Oct. 25, 1996, Appl. No. 736,934

Claims priority, application Germany, Oct. 27, 1995, 195 40 158

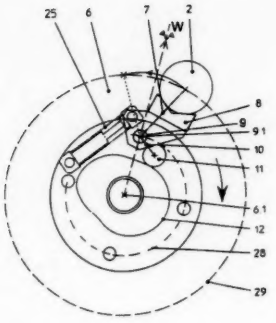
Int. Cl.[7] B65G *47/26*

U.S. Cl. 198—438 **17 Claims**

1. A device for transferring objects from an arriving conveying means to an exiting conveying means, the device comprising:

a rotatingly driven rotor having a rotor axis;

holding means for holding said objects, said holding means being articulated to said rotor for common drive, said holding



means being arranged mounted on a pendulum shaft of said rotor pivotably around a holding means pivot axis located at a spaced location from said rotor axis, said shaft having an opening for a fluid connection on a front side, said holding means being connected to a vacuum source through said opening to establish a vacuum to hold said objects on said holding means;

a cam; and

control means connected to said holding means, said control means being restrictedly guided along said cam to generate a nonuniform conveying velocity of said holding means.

6,015,041

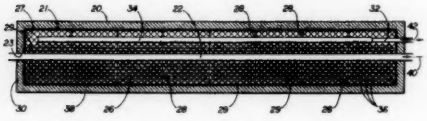
APPARATUS AND METHODS FOR STORING AND RELEASING HYDROGEN

Leung K. Heung, Aiken, S.C., assignor to Westinghouse Savannah River Company, Aiken, S.C.

Filed Apr. 1, 1996, Appl. No. 626,058

Int. Cl.[7] C01B *3/04;* **F17C** *11/00*

U.S. Cl. 206—0.7 **8 Claims**



4. A device for storing and discharging hydrogen comprising:

a. a container comprising:

i. a port for ingress and egress of the hydrogen;

ii. an upper portion; and

iii. a lower portion;

b. hydrogen-storage media positioned within the container;

c. at least one divider positioned within the container so as to divide it into a plurality of chambers, each chamber having hydrogen-storage media positioned therein; and

d. a conduit having an elongated section positioned in the lower portion of the container, for conveying a fluid adapted to transfer heat to or draw heat from the hydrogen-storage media.

6,015,042

DOUBLE-ARMED SUTURE PACKAGE HAVING RAMPED NEEDLE PARK

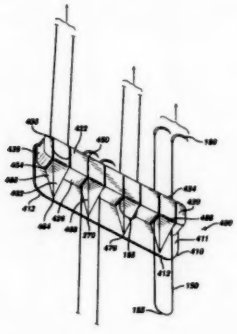
Robert James Cerwin, Pipersville, Pa.; Deborah M. Transue, Bridgewater, and Marvin Alpern, Glen Ridge, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of application No. 09/022,581, Feb. 12, 1998, abandoned. This application Nov. 17, 1998, Appl. No. 193,188.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61B *17/06*

U.S. Cl. 206—63.3 **7 Claims**



7. A suture retaining ramp comprising:

a base member having a top side and a bottom side;

a plurality of projections extending up from the top side of the base member, said projections having a top side, a proximal side, a distal side and opposed end sides, said projections separated from each other by slots; and,

a plurality of ramped members extending up from the top side of the base member, the ramped members having a sloped top side, a pair of opposed sides, a distal end and a proximal end, wherein the distal side of each ramped member intersects the proximal side of a projection, and wherein the proximal end of each ramped member intersects the top side of a base member, and wherein the distal end of the sloped top side of each ramped member intersects the top side of a projection.

6,015,043

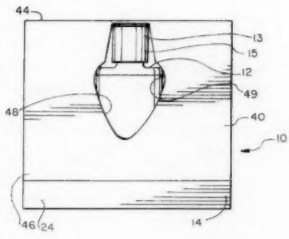
FOLDED BOTTLE DISPLAY PACKAGING

Thomas Michael Sandberg, Minneapolis, and George Webinger, Golden Valley, both of Minn., assignors to The Traveling Herbalist, Inc., Golden Valley, Minn.

Provisional application No. 60/067,074, Nov. 20, 1997. This application Nov. 17, 1998, Appl. No. 193,477.

Int. Cl.[7] B65D *85/20;5/50*

U.S. Cl. 206—446 **3 Claims**



1. A display package for a bottle that has a bottom and a top; the display package comprising:

(a) a base section having a bottom, a top, a front, a back, and a front-to-back length, the top having a hole therein adapted for receiving the bottom of the bottle; and

(b) a wrap-around section having

(i) a back side having a bottom edge and a top edge, the bottom edge attached to the back of the base section,

(ii) a generally planar top portion attached to the top edge of the back side, the top portion having a length smaller than the front-to-back length of the base section, and

(iii) a generally planar front side extending from the top portion to the front of the base section, the front side having a window proximate the top portion, the window being adapted to allow a portion of the top of the bottle to extend through the plane created by the front side by passing through the window.

6,015,044

PAPERBOARD CARRIER FOR STATIC CLING VINYL PRODUCTS

Ralph Scott Peterson, Clifton Forge, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of application No. 08/387,333, Feb. 13, 1995, Pat. No. 5,643,388. This application Mar. 17, 1997, Appl. No. 819,641.

Int. Cl.[7] B65D *5/00*

U.S. Cl. 206—460 **3 Claims**

1. A paperboard carrier for carrying static vinyl products, wherein said carrier is comprised of:

a paperboard carrier base;

an extruded layer of high density polyethylene located exterior to said paperboard base such that said polyethylene layer is cooled and surface treated to provide a predetermined smoothness and surface energy to said polymeric layer; and

a static cling vinyl product operatively attached to said extruded layer.

6,015,045

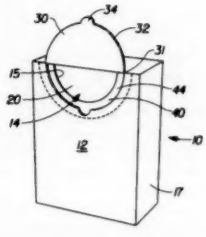
HYGIENIC PACKAGE WITH A RECLOSABLE FLAP

Gary Curtis Joseph; Charles John Berg, Jr., both of Cincinnati, and Ricky Alan Pollard, Moscow, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 9, 1996, Appl. No. 695,281

Int. Cl.[7] A61F *13/20*

U.S. Cl. 206—494 **13 Claims**



1. A package for containing hygienic articles to be dispensed therefrom, said package comprising:

a container body for holding said hygienic articles, said container body having at least one wall with an opening therethrough, said opening being cut from said wall and having a first predetermined open area exposing a first exposed area of said hygienic articles;

a retaining band juxtaposed with said opening and joined to said wall, said retaining band covering a portion of said first exposed area, thereby decreasing said first exposed area to form an aperture through which said hygienic articles are dispensed, said aperture having a second predetermined open area smaller than said first predetermined open area;

a cover flap hingedly connected to said container body, said cover flap being articulable between a first open position whereby said hygienic articles can be dispensed and a second closed position whereby said hygienic articles are not exposed outside said package, whereby in said closed position said cover flap covers substantially all of said aperture; and

a fastening means to fasten said cover flap in said closed position.

6,015,046

STACKABLE RECEPTACLE

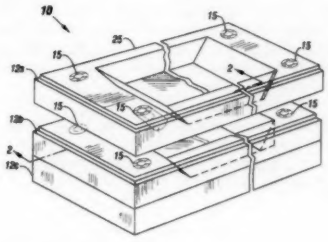
Steven J. Brunelle, Boise, Id., assignor to Micron Eletronics, Inc., Nampa, Id.

Filed May 5, 1998, Appl. No. 72,899

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B65D *21/02;21/032*

U.S. Cl. 206—511 **7 Claims**



1. An assembly comprising:

a first receptacle including a first side with a first opening from a first slot therein obliquely disposed relative to the first side;

a second receptacle including a second side with a second opening from a second slot therein obliquely disposed relative to the second side in parallel relation to the first slot, the first and second openings being substantially vertically aligned; and

a pin reciprocable within the second slot to extend therefrom into the first slot responsive to gravity to engage the first receptacle and the second receptacle.

6,015,047

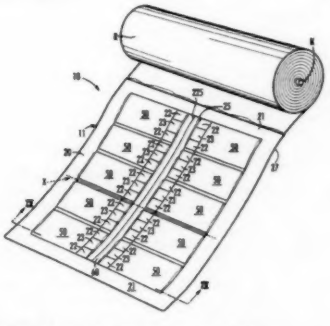
INFLATABLE PACKAGE CUSHIONING AND METHOD OF USING SAME

Steven J. Greenland, 1909 Windy Oaks Rd., Hixson, Tenn. 37343

Filed Apr. 8, 1998, Appl. No. 57,297

Int. Cl.[7] B65D *81/02;* **B65B** *31/02*

U.S. Cl. 206—522 **19 Claims**



1. An inflatable cushioning system, comprising:

a plurality of inflatable cushioning chambers, each said chamber having a one way inflation valve and corresponding inflation port with a corresponding outer terminus;

a common inflation tool guideway extending through the middle of said chambers for the entire length of said chambers, and intersecting each of said inflation ports at each respective said outer terminus, said inflation tool guideway for directing an inflation tool to each of said inflation ports and said inflation tool guideway for coupling said inflation tool to a plurality of said outer termini of said inflation ports in fluid communication whereby fluid within the inflation tool may enter a plurality of said inflation ports;

said plurality of chambers being inflated; and

said common inflation tool guideway being ruptured along the extent of said inflation tool guideway.

15. A method of cushioning a package, comprising the steps of:

providing a product;

providing an inflatable cushioning system, said cushioning system comprising:

a plurality of separate inflatable cushion chambers, each of said chambers having an inflation port; and

a common fluid inlet in fluid communication with said plurality of inflation ports; said common fluid inlet extending through the center of, and for the full extent of, said plurality of chambers;

inflating said plurality of chambers;

rupturing said common fluid inlet the entire extent of said common fluid inlet; and

positioning said inflated inflatable cushioning system adjacent said product in said package.

6,015,048

GAS CURRENT CLASSIFIER AND PROCESS FOR PRODUCING TONER

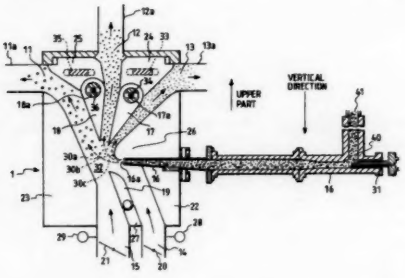
Satoshi Mitsumura, and Yoshinori Tsuji, both of c/o Canon Kabushiki Kaisha 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

Filed Sep. 20, 1995, Appl. No. 531,061

Claims priority, application Japan, Sep. 21, 1994, 6-251575; Dec. 28, 1994, 6-337581; Dec. 28, 1994, 6-337620

Int. Cl.[7] B07B *4/00;7/04*

U.S. Cl. 209—143 **15 Claims**



1. A gas current classifier comprising a classifying chamber, a material feed nozzle for introducing a material powder in a gas stream into the classification zone of the classifying chamber, a Coanda block for classifying the material powder thus introduced by the Coanda effect to separate the powder into at least a fraction of fine powder, a fraction of medium powder and a fraction of coarse powder, and a low block at the lower part of the classifying chamber, wherein

said classification zone is defined by at least the Coanda block and a classifying edge,

A location of said classifying edge is changeable,

said low block has a knife edge-shaped gas-intake edge and gas-intake pipes opening to the classifying chamber for introducing a rising current of air into the classification zone,

a location of said gas-intake edge is changeable,

said material feed nozzle has a material receiving opening at the upper part of the material feed nozzle for introducing the material powder into the material feed nozzle and an injection nozzle at the rear end of the material feed nozzle, such that said material powder is accelerated by the gas stream fed through the injection nozzle within the material feed nozzle, a fraction of fine powder in the material powder forms an upper stream within the material feed nozzle and a fraction of coarse powder in the material powder forms a lower stream within the material feed nozzle; and

said Coanda block is provided at a position higher than the orifice of the material feed nozzle for classifying the powder as the rising current of air from the gas-intake pipes lifts the powder into the classifying zone, whereby the flows of the upper stream and the lower stream are not disturbed, the flow of coarse powder is classified in an outer circumference of the classifying zone and the flow of fine powder is classified in an inner circumference of the classifying zone, by the Coanda effect.

6,015,049

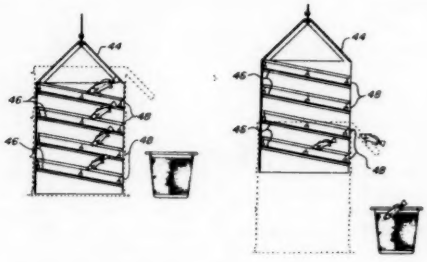
UP-FLOW FISH GRADER APPARATUS AND METHOD

David L. Heikes, Pine Bluff, Ark., assignor to The Board of Trustees of the University of Arkansas, Little Rock, Ark.

Provisional application No. 60/062,704, Oct. 22, 1997. This application Aug. 31, 1998, Appl. No. 144,035.

Int. Cl.[7] B07B *13/05;1/28*

U.S. Cl. 209—675 **14 Claims**



1. A fish grader comprising:

(a) a holding vat having an open top that may receive fish;

(b) a panel box, said panel box fifting within said holding vat when said panel box is lowered and filting through the open top of said holding vat when raised, said panel box comprising at least one grading panel wherein said grading panel comprises:

(i) a pluralitv of evenly-spaced panel bars;

(ii) a plurality of crossbars beneath said panel bars; and

(iii) a plurality of panel bar supports attaching each panel bar to each crossbar and providing space between each panel bar and each crossbar;

(c) means to raise and lower said panel box; and

(d) a water pump hydraulically connected to said holding vat.

6,015,050

MODULAR STORAGE SYSTEM

Mark D. Gilbertson, 19070 Easton Rd., Deephaven, Minn. 55391

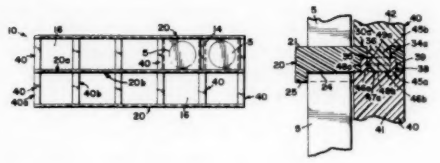
Filed Oct. 31, 1996, Appl. No. 741,652

Int. Cl.[7] A47G *29/00*

U.S. Cl. 211—40 **21 Claims**

1. A modular storage system comprising:

a plurality of longitudinal first members, each of the first members having female connectors;



a plurality of longitudinal second members, each of the second members having male connectors; and

wherein the first and second members extend longitudinally orthogonal to one another, and the first and second members are removably coupled to one another by inserting male connectors into the female connectors, connections between the male and female connectors are arranged and configured such that one of the first members is capable of orthogonally connecting to at least two second members, and that one of the second members is capable of orthogonally connecting to at least two first members, the first and second members are capable of forming a 2-D lattice structure which includes a plurality of receptacles, each of the receptacles is formed by two first members and two second members wherein the first and second members are pivotally coupled to one another such that the first and second members are capable of forming a 3-D lattice structure.

6,015,051

SHELF ASSEMBLY WITH PUSHER HAVING MEMORY CHARACTERISTIC AND METHOD OF USE

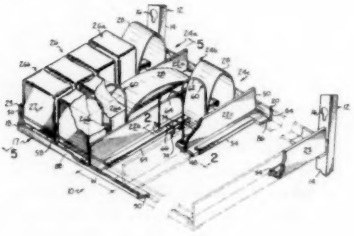
Joseph M. Battaglia, Douglasville, Ga., assignor to L&P Property Management Company, South Gate, Calif.

Filed Aug. 28, 1997, Appl. No. 919,891

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A47F *1/04;1/12*

U.S. Cl. 211—59.3 **39 Claims**



1. A shelf assembly comprising:

a shelf frame having a front frame member and a rear frame member and a plurality of substantially parallel spaced dividers extending between said front frame member and said rear frame member, each of said dividers having a horizontal portion and a vertical portion, the horizontal portions of the dividers defining substantially planar supporting surfaces, an adjacent pair of said dividers defining a track for supporting a plurality of products arranged in a column between said pair of adjacent dividers; and

a pusher for urging said column of products forwardly along said track, said pusher comprising a sheet of material having a memory characteristic, said pusher having a plurality of recesses, said horizontal portions of said pair of adjacent dividers being received inside said recesses of said pusher so as to retain and guide said pusher in said track, said pusher being adapted to assume an upwardly bowed inverted U-shaped configuration above said supporting surfaces between said rear frame member and a rearwardmost one of said products in said track upon receipt of said column of products such that said memory characteristic biases said sheet toward a flat planar orientation so as to urge said column of products toward said front frame member.

6,015,052

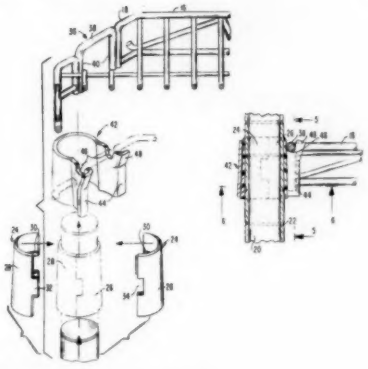
MODULAR SHELVING SYSTEM

Mark Goldberg, Lido Beach, and Marc G. Block, Wantagh, both of N.Y., assignors to Global Equipment Company a Division of Global Direct Mail, Port Washington, N.Y.

Filed Sep. 29, 1997, Appl. No. 939,585

Int. Cl.[7] A47F *5/00*

U.S. Cl. 211—187 **3 Claims**



1. A shelving system, comprising:

a polygonal shelf assembly having at least three bracket receiving sections;

at least three shelf supporting assemblies for supporting said polygonal shelf assembly;

at least three posts being releasably coupled to said at least three shelf supporting assemblies for supporting said polygonal shelf assembly;

each of said shelf supporting assemblies including a collar and a support bracket, said support brackets having a shelf receiving section, each of said collars being frictionally coupled to said at least three posts, each of said support brackets being frictionally engaged to said collars, said at least three bracket receiving sections of said polygonal shelf assemblies being releasably coupled to said shelf receiving sections of said support brackets;

said support brackets being generally U-shaped and including a shelf receiving section and load support ends, said load support ends extending essentially from each of the ends of said U-shaped member; and

said bracket receiving section of said shelf assembly extending substantially perpendicular to said shelf assembly and including a mounting section and at least two support walls, said mounting section being essentially parallel to said shelf assembly and said two support walls being substantially perpendicular to said shelf assembly, said mounting section of said bracket receiving section being releasably coupled to said receiving section of said support brackets and said two support walls being rested against said load support ends of said support brackets.

6,015,053

ALL-PLASTIC SHELF UNIT MODULE HAVING A SLIDING DRAWER

Tony L. Sheng, Livingston, N.J., assignor to Honeyware, Inc., Kearny, N.J.

Continuation-in-part of application No. 29/076,783, Sep. 19, 1997, Pat. No. Des. 400,739. This application Aug. 25, 1998, Appl. No. 139,615.

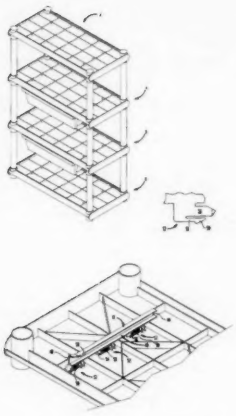
This patent is subject to a terminal disclaimer.

Int. Cl.[7] A47B *88/04*

U.S. Cl. 211—188 **7 Claims**

1. An all-plastic shelf unit module with a sliding drawer supported below its underside, comprising:

an open-topped rectangular plastic drawer having two parallel side pieces and two parallel, horizontally elongated slide



pieces, each slide piece being located at the top edge of a corresponding one of the side pieces and extending horizontally outwardly therefrom;

two plastic slide supports, each having an elongated recess dimensioned to receive a corresponding one of the slide pieces and further having at least one integrally formed intermittent plug located on its top, each of said at least one plug being elongated parallel to the recess in its slide support; and

a plastic shelf piece having horizontal top and bottom surfaces and a plurality of integrally formed sockets extending downwardly from the bottom surface, the sockets being dimensioned to receive the plugs of the slide supports when the plugs are introduced therein by horizontal motion and being located in such a manner that when the plugs are received within the sockets, the slide supports are mounted under the bottom surface with the recesses being horizontal, parallel to each other, and facing each other, the recesses being so spaced apart from each other as to slidably receive the slides and thereby support the drawer beneath the bottom of the shelf piece and between the slide supports.

6,015,054

CONTAINER CLOSURE ASSEMBLY WITH PROFILED SCREW THREADS

Roger Milner King, and Witney Milner King, both of Latimer, United Kingdom, assignors to Beeson and Sons Limited, England, United Kingdom

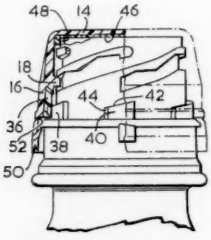
PCT No. PCT/GB96/03028, § 371 Date Dec. 24, 1998, § 102(e) Date Dec. 24, 1998, PCT Pub. No. WO97/21602, PCT Pub. Date Jun. 19, 1997

PCT Filed Dec. 9, 1996, Appl. No. 77,716

Claims priority, application United Kingdom, Dec. 8, 1995, 9525146; Dec. 18, 1995, 9525876

Int. Cl.[7] B65D *41/36*

U.S. Cl. 215—252 **22 Claims**



1. A container closure assembly comprising:

a container neck having an opening;

a closure for said neck, the closure having a crown portion and a skirt portion;

a first screw thread on one of said neck and said closure, said first screw thread comprising one or more elongate first thread segments, each first thread segment having upper and lower first thread surfaces; and

a substantially continuous second screw thread on the other of said neck and said closure, said second screw thread comprising one ore more elongate second thread segments, each second thread segment having upper and lower second thread surfaces, wherein the pitch of the lower second thread surface is relatively lower in a first region, relatively higher in a second region displaced from the first region in an unscrewing direction and relatively lower in a third region displaced from said second region in a unscrewing direction, and wherein said lower second thread surface further comprises a step adjacent to said third region to provide a first abutment surface against which a second abutment surface on one of said first screw segments abuts to block or restrict rotation of said closure in an unscrewing direction at an intermediate position when said closure is under axial pressure in a direction emerging from the container neck, said neck and closure being constructed and arranged to provide a vent for venting gas from said container neck at least when said closure is in said intermediate position, and said neck and closure being constructed and arranged to enable said step and said first screw segments to be moved out of engagement by axial displacement of the closure inwardly on said neck at said intermediate position, and wherein the lower second thread surface in said first region forms a matching fit with a major part of said upper first thread surface when the closure is fully secured in the container neck, and said third region forms a matching fit with a major part of said third region of said upper first thread surface when the closure is at said intermediate position and outwardly displaced on said container neck.

6,015,055

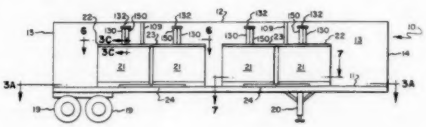
CONVERTIBLE FREIGHT CONTAINER

James J. Bonerb, Orchard Park; Thomas J. Bonerb, West Falls, and David Bounerba, Orchard Park, all of N.Y., assignors to Converta-Vans, Incorporated, Buffalo, N.Y.

Filed May 29, 1996, Appl. No. 654,855

Int. Cl.[7] B65D *5/00*

U.S. Cl. 220—1.5 **36 Claims**



1. A freight container which is convertible for selectively carrying solid freight or bulk liquid freight comprising a freight container housing having a floor and a roof and walls, at least one collapsible tank in said freight container housing which tank can be selectively repeatedly converted between collapsed and expanded conditions, a first liquid outlet in said tank, a conduit in communication with said first liquid outlet and located entirely within said housing, a second liquid outlet on said conduit, said second liquid outlet being located within said housing, and an opening in said housing proximate said second liquid outlet.

6,015,056

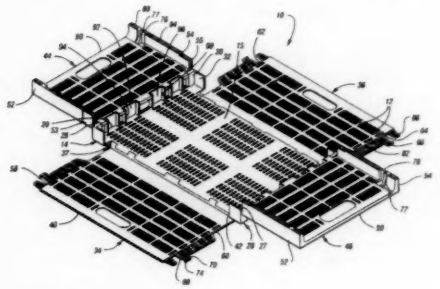
COLLAPSIBLE CONTAINER

Trenton M. Overholt, Playa Del Rey, Calif.; William Patrick Apps, Alpharetta, Ga., and Gerald R. Koefelda, Hermosa Beach, Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.

Filed Dec. 19, 1997, Appl. No. 994,061

Int. Cl.[7] **B65D** *6/12*

U.S. Cl. 220—6 **18 Claims**



1. A collapsible container, comprising:

a base having first and second pairs of opposing edges, one of the first and second pairs of opposing edges each defined by an upstanding base wall;

a first pair of opposing side walls each pivotably attached to a corresponding one of the first and second pair of opposing edges of the base, each of the first pair of opposing side walls having a pair of opposing lateral flanges inwardly depending therefrom and integral therewith, each lateral flange having a latch receiver formed therein, the latch receiver including an aperture and a flexible latch hinge and having a latch release member actuable by a user; and

a second pair of opposing side walls each pivotably attached to a corresponding other of the first and second pairs of opposing edges of the base, each of the second pair of opposing side walls having a pair of opposing lateral edges, each lateral edge having a latching member attached thereto,

wherein when the container is oriented in an assembled position, each lateral flange of the first pair of opposing side walls abuts an adjacent lateral edge of the second pair of opposing side walls so that each aperture receives a corresponding latching member which is fastened into position by the latch hinge, thereby forming a secure attachment between the first and second pairs of opposing side walls, and wherein to return the container to a collapsed position from the assembled position, each latch release member is actuated by the user in order to release the latching member fastened therein.

6,015,057

FLEXIBLE CONTAINER FOR FLOWABLE MATERIALS

Michael George Stone, Howden, United Kingdom, and Christopher Cuddy, Cork, Ireland, assignors to Storsack Tradco Limited, East Yorkshire, United Kingdom

PCT No. PCT/IE96/00078, § 371 Date Aug. 12, 1998, § 102(e) Date Aug. 12, 1998, PCT Pub. No. WO97/20758, PCT Pub. Date Jun. 12, 1997

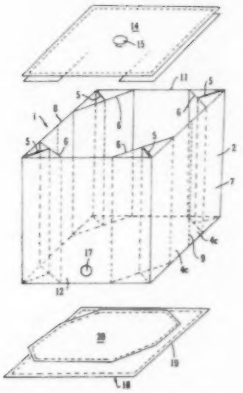
PCT Filed Dec. 4, 1996, Appl. No. 77,511

Claims priority, application United Kingdom, Dec. 4, 1995, 9524766

Int. Cl.[7] **B65D** *90/00*

U.S. Cl. 220—9.2 **13 Claims**

1. A container comprising a flexible body which is collapsible and erectable, said body having a base and side walls, and stiffening means to stiffen the flexible body, and a transverse gusset is provided at each corner between adjacent side walls, and a



reinforcer extends from the corner to the gusset, said reinforcer being provided with stiffening means.

6,015,058

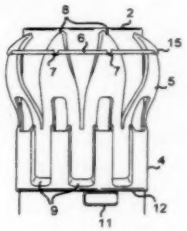
PAINTBALL GUN LOADER

Gerald R. Parks, Chula Vista, Calif., assignor to John R. Gregory, Bonita, Calif.

Filed Sep. 8, 1998, Appl. No. 149,720

Int. Cl.[7] **B65D** *43/14;43/22;51/00*

U.S. Cl. 220—229 **9 Claims**



1. A self-sealing cap slidably engaged over the cylindrical opening rim of a vessel, said cap comprising:

an annular wall having a lower edge shaped and dimensioned to slip over said rim;

substantially symmetrical, separate, contiguous and substantially triangular segments each extending from said annular wall to a tapering apex portion; and

resilient means for biasing said apex portions toward one another to form a segmented dome over said annular wall;

whereby when said annular wall is slided down over said rim, the rim causes said segment to pull apart and expose said rim, and when said annular wall is moved upwardly away from said rim, the apex portions move back toward one another.

6,015,059

CAN WITH SEAL

Yoshikazu Takayama, 19-5, Ostuka 5-chome, Sunkyo-ku, Tokyo 112, Japan

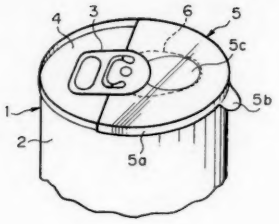
Continuation-in-part of application No. 08/693,528, Aug. 2, 1996. This application Jun. 8, 1998, Appl. No. 93,139.

Claims priority, application Japan, Aug. 4, 1995, 7-219576

Int. Cl.[7] **B65D** *51/22*

U.S. Cl. 220—258 **5 Claims**

1. A can with a seal comprising:



a can having a top lid, the top lid having a pull top member and an open portion therein;

a seal provided with an adhesive including an anti-bacterial agent on an inside surface of the seal, the inside surface of the seal being detachably attached to the top lid of the can having the pull top member, wherein the seal covers the open portion of the can, the open portion of the can being opened by raising the pull top member such that the member is pressed down and the open portion serves as a tap, and wherein the seal remains adhesively attached to the top lid of the can to prevent its contents from splashing out of the can.

6,015,060

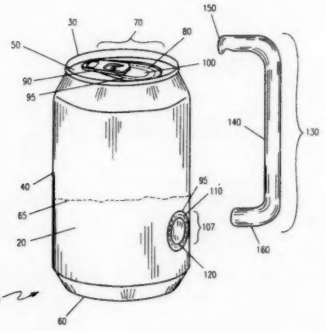
BEVERAGE CONTAINER AND OPENING MEANS

Tim Rightenour, and David Jordan, both of 2304 Sunny Brook Dr. #106, Nampa, Id. 83686

Filed Jun. 5, 1998, Appl. No. 92,522

Int. Cl.[7] **B65D** *17/34*

U.S. Cl. 220—269 **4 Claims**



1. A dual aperture beverage container and opening means comprising:

a container, said container being of cylindrical configuration, constructed from metal, and used to hold carbonated and malt beverages, said container further comprising a container top, a container bottom, a container side wall, a container rim, and a pouring aperture assembly located on said container top, which opens a pouring aperture from which liquids can be poured;

a vent aperture assembly, said vent aperture assembly being located on said container side wall, and used to provide a venting means for said liquids in said container;

a venting aperture opening means, said venting aperture opening means being used to open said venting scored portion, wherein said venting aperture opening means further comprises:

a main shaft, said main shaft having two ends and being an elongated, cylindrical, slightly curved shaft, constructed of plastic;

a rim attachment means, said rim attachment means being located on one end of said main shaft, said rim attachment means having a hook type configuration, consisting of an arc with circumference spanning 180 degrees, said rim attachment means being used to attach said venting aperture opening means to said container rim, allowing said venting aperture opening means to pivot on said container rim;

a venting aperture opening protrusion, said venting aperture opening protrusion being located on the other end of said main shaft, opposite said rim attachment means, said venting aperture opening protrusion being a cylindrical, linear shaft, extending outward, perpendicular to the centerline of said venting aperture opening means, parallel to said rim attachment means, and extending outward in the same horizontal direction as said rim attachment means, with said venting aperture opening protrusion terminating in a flat, circular surface that is parallel to the centerline of said main shaft.

6,015,061

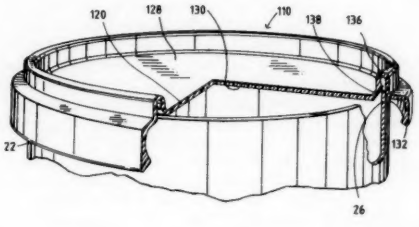
DUAL FUNCTION OVERCAP

James W. Lowry, Florence, S.C., assignor to Sonoco Development, Inc., Hartsville, S.C.

Filed Jul. 10, 1998, Appl. No. 113,989

Int. Cl.[7] **B65D** *51/00*

U.S. Cl. 220—287 **4 Claims**



1. A dual function overcap for use with a beaded container having a plurality of separable sections which can be separated to reduce the height of the container, said overcap comprising:

a substantially planar covering portion;

a raised annular member circumferentially disposed about the covering portion and having an inner wall and an outer wall joined at an apex and defining a channel therebetween, said channel having a single finite diameter and configured to receive and retain a shortened container edge; and

a lip extending downwardly from the outer wall of the raised annular member and configured to receive and retain a bead.

6,015,062

RESEALABLE BEVERAGE CONTAINER AND TOP THEREFOR

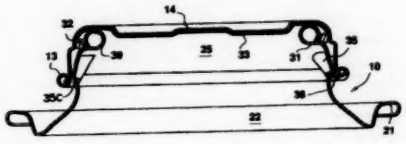
Henry C. Bachmann, Dayton; Steven T. Cook, Bellbrook; James R. Schubert; John F. Schubert, both of Dayton, and Lori E. Strong, Huber Heights, all of Ohio, assignors to Dayton Systems Group, Inc., Miamisburg, Ohio

Provisional application No. 60/031,119, Nov. 18, 1996. This application Nov. 17, 1997, Appl. No. 971,523.

Int. Cl.[7] **B65D** *41/06*

U.S. Cl. 220—295 **9 Claims**

1. A resealable container end for attachment to a liquid holding container, said end comprising

a neck portion having a lower edge including a peripheral wing part for incorporation in a rolled seam with an upper edge of a can body,

said neck portion having a generally cylindrical central upper part of less diameter than said wing part and including a pouring opening with a surrounding curl, said upper part of said neck portion including a ledge about said surrounding curl,

a first set of lugs formed outward to a first diameter about said upper part for cooperation with a closure hat member,

a removable closure hat member covering said pouring opening and including a top panel and a rim shaped to extend downward from said top panel around said upper neck part, said rim terminating in a generally circular lower edge,

a seal member within said closure hat member extending entirely around said rim, said seal member having an inner diameter less than said surrounding curl whereby said seal member can be compressed against said ledge and said surrounding curl when said closure hat member is in place on said neck portion,

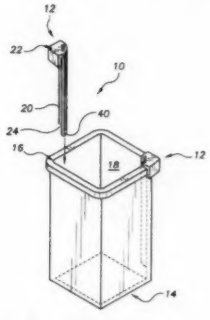
a second set of lugs formed inward within said rim of said closure hat member to a second diameter less than said first diameter of said first set of lugs to latch under said first set of lugs to retain said seal member in sealed relationship with said surrounding curl of said pouring opening.

6,015,063

TRASH CAN VENT SYSTEM

Darrell A. Poliquin, 18698 Garfield, Redford, Mich. 48240

Filed Oct. 22, 1998, Appl. No. 177,239
Int. Cl.[7] B65D *67/04*
U.S. Cl. 220—495.04 **4 Claims**



1. A trash can vent system comprising:

a vent structure assembly including an elongated vent channel member and an edge securing cap formed at one end of said elongated vent channel member;

said vent channel member being open along a side thereof and defining a vent channel along said length thereof;

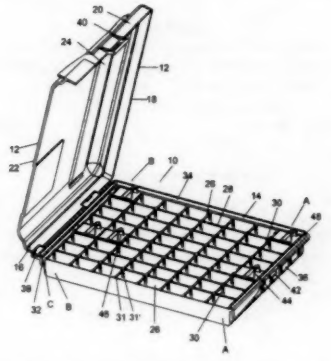
said edge securing cap including a right angled corner lip extending outwardly from a cap top having said right angled open side oriented toward said open side of said elongated vent channel member, two can edge receiving slots, each formed between one end of said corner lip and one of said two parallel side edges of said elongated vent channel member, and a cap opening defined through said cap top and in connection with said vent channel of said elongated vent channel member.

6,015,064

PORTABLE CLOSABLE CONTAINER WITH INDIVIDUALLY CLOSABLE CELLS

Gang Liu, Novi, Mich., assignor to Analog Technologies, Inc., Novi, Mich.

Filed Dec. 23, 1997, Appl. No. 996,860
Int. Cl.[7] B65D *1/24;85/42*
U.S. Cl. 220—524 **22 Claims**



1. A container for housing plural components, the container comprising:

a lid defined by a main lid wall and a peripheral lid wall, said peripheral lid wall including a front wall, a pair of opposing side walls, an underside having an integrally-molded cell cover-closing structure formed thereon;

a base including a main base wall and a peripheral base wall, said peripheral base wall including a back wall, a front wall, a bottom wall, and a pair of opposing side walls, said main base wall and said peripheral base wall defining in part an interior space, said lid being positionable upon said base to substantially enclose said interior space;

at least ten component-holding cells formed in said interior space of said base, each of said at least ten component-holding cells including a pair of adjoining side walls, said side walls being common with side walls of two other of said cells, each of said cells further including base wall, said main base wall of said base and said base wall of each of said at least ten component-holding cells being the same, said base and said at least ten component-holding cells being integrally formed;

plural cell covers, each of said cell covers being formed to substantially provide a closure to a respective one of said at least ten component-holding cells, each of said cell covers including a hinge portion for removable attachment to one of said cells, each of said cell covers having a contact region against which said cell cover-closing structure of said lid presses when said lid is moved to its closed position;

whereby said lid encloses said at least ten component-holding cells and said cell covers when said lid is positioned upon said base to substantially enclose said interior space.

22. A container for housing plural components, the container comprising:

a lid defined by a main lid wall and a peripheral lid wall, said lid including an underside and an integrally-molded cell cover-closing structure formed thereon;

a base defined by a main base wall and a peripheral base wall, said lid being positionable upon said base, said lid being movable between an open position and a closed position with respect to said base;

a plurality of rows and columns of component-holding cells formed in said interior space of said base, each of said component-holding cells including a base wall that is common with and forms part of said main base wall, said base and each of said component-holding cells being an integrally formed, continuous piece of polymerized material;

a plurality of cell covers, each of said cell covers being defined to substantially provide a closure to its respective component-

holding cell, each of said cell covers having a contact region against which said cell cover-closing structure of said lid presses when said lid is moved to its closed position,

whereby said lid extends over each of said component-holding cells and their respective cell covers when said lid is moved to its closed position.

6,015,065

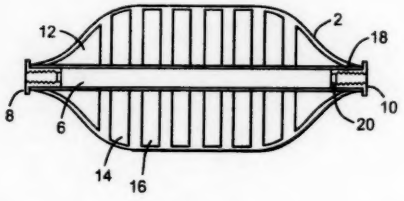
COMPACT FLUID STORAGE SYSTEM

Roy E. McAlister, 1739 W. 7th Ave., Mesa, Ariz. 85202-1906

Filed Aug. 29, 1997, Appl. No. 921,134

Int. Cl.[7] B65D *25/02;* **F17C** *1/06*

U.S. Cl. 220—586 **12 Claims**



1. A vessel for storing a fluid, comprising:

(a) an exterior shell defining a cavity and including at least one impermeable membrane for containing said fluid therein;

(b) means for adding and removing said fluid;

(c) means for substantially arresting forces produced by said fluid interacting with said exterior shell, said means for arresting forces including at least one internal structure located in said cavity, said at least one internal structure being made of a material selected from the group consisting of graphite crystals, boron nitride crystals, and exfoliated crystals of such materials, said internal structure dividing said cavity into a plurality of fluid receiving spaces.

6,015,066

LIQUID SUPPLYING DEVICE

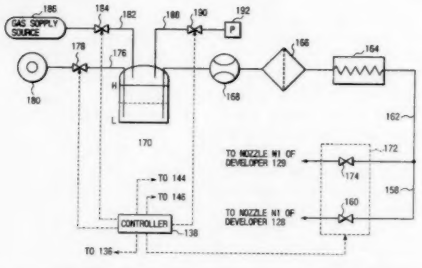
Yoshio Kimura; Satoshi Morita; Yuji Matsuyama, and Norio Semba, all of Kumamoto-ken, Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Dec. 16, 1997, Appl. No. 991,783

Claims priority, application Japan, Dec. 24, 1996, 8-355723; Dec. 25, 1996, 8-356119

Int. Cl.[7] B67D *5/08*

U.S. Cl. 222—64 **15 Claims**



1. A liquid supply device for supplying a liquid to a plurality of apparatuses which include a first apparatus and a second apparatus, and each of which has at least one liquid-applying member for applying the liquid to an associated one of a plurality of substrates to process the substrates, comprising:

at least one tank for containing the liquid;

a supply passage for supplying the liquid from said tank to the apparatuses;

branch passages communicating with said supply passage, for supplying the liquid to each of the liquid-applying members;

valves provided on said branch passages, respectively, for opening and closing said branch passages;

control means for controlling the valves such that when one of the valves is opened, the others are closed, in a case where the liquid-applying member of one apparatus is applying the liquid to the substrate, the liquid-applying members of the other apparatuses cannot apply the liquid, and there is a time period in which the liquid is not applied, between a time at which the liquid-applying member of said first apparatus applies the liquid and a time at which the liquid-applying member of said second apparatus applies the liquid; and

means for setting an upper-limit level and a lower-limit level of the liquid stored in the tank so that the liquid is replenished to a level between the upper-limit level and the lower-limit level while the liquid-applying members of said apparatuses remain to apply the liquid to the substrates.

6,015,067

BOTTLE TOP DISPENSER

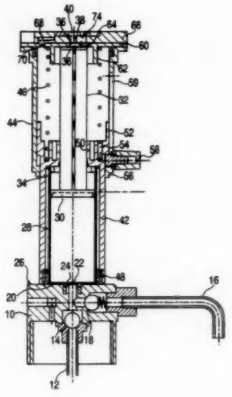
Andreas Lang, Marktheidenfeld, and Hubert Kunze, Kreuzwertheim, both of Germany, assignors to Brand GmbH + Co., Germany

Filed Jan. 22, 1998, Appl. No. 10,659

Claims priority, application Germany, Jan. 27, 1997, 197 02 773

Int. Cl.[7] B67D *5/40*

U.S. Cl. 222—153.13 **23 Claims**



1. A bottle top comprising:

a valve housing which can be set onto a bottle

a piston-cylinder unit removably and interchangeable affixed to said valve housing, said piston-cylinder unit comprising a piston and cylinder, one part of which is stationary and the other part of which is movable relative to the one part in an axially-directed reciprocable stroke, for movement between a draw-out axial end position, in which said unit serves to draw liquid in from the bottle, and a manually-activated push-in axial end position, in which liquid drawn in from a bottle is ejected; and

a dispenser for dispensing the liquid contents of the bottle, said dispenser including an activation unit having means for activating said piston-cylinder unit to effect movement thereof between said draw-out and push-in positions, said activation unit being releasably affixed to said valve housing, and said means for activating including spring means for moving said

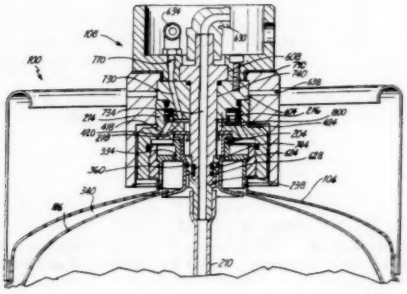
piston-cylinder unit into said draw-out position and manually-operated means for moving said piston-cylinder unit into said push-in position.

6,015,068

LIQUID CHEMICAL DISPENSING SYSTEM WITH A KEY CODE RING FOR CONNECTING THE PROPER CHEMICAL TO THE PROPER ATTACHMENT

Michael L. Osgar, Eagan, and Mirsaeed Rouzegar, Minneapolis, both of Minn., assignors to Now Technologies, Inc., Bloomington, Minn.

Filed Feb. 4, 1998, Appl. No. 18,709
Int. Cl.[7] B65D *83/00*
U.S. Cl. 222—400.7 **24 Claims**



1. A container for holding liquid chemicals comprising:
an outer container having a mouth;
an inner container having a port;
means for coupling the port to the mouth;
a closure coupled to the mouth, the closure having an aperture and a first gas passageway therethrough, the first gas passageway in communication with an outside of the inner container;
a key code ring removably supported at an upper end of the closure;
a connector for coupling with the closure, the connector having a bottom end and a second gas passageway therethrough in communication with a gas source; and
a key pattern connected to the bottom end of the connector, the key pattern configured to mate with the key code ring so as to form a manifold in communication with the first gas passageway and the second gas passageway.

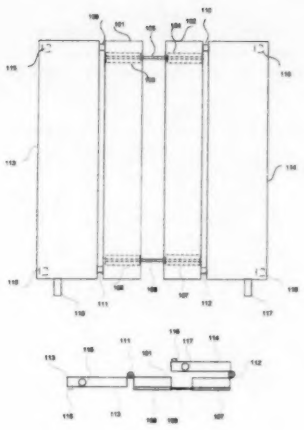
6,015,069

GARMENT FOLDING TABLE

Larry Alan Christensen, 103 St. Croix Ct., Aurora, Ill. 60504

Filed May 11, 1998, Appl. No. 75,640
Int. Cl.[7] A41H *33/00*
U.S. Cl. 223—37 **2 Claims**

1. A manual garment folding table comprising:
a rectangular bed having a length and a width, a rectangular left folding arm having a length equal to the length of said bed and a fixed width, offset hinge means attached to one long edge of said left arm and to one long edge of said bed, a rectangular right folding arm having a length equal to the length of said bed and a fixed width, and offset hinge means attached to one long edge of said right arm and to the other long edge of said bed, said offset hinge means constructed to provide a gap of a planned width between the opposing



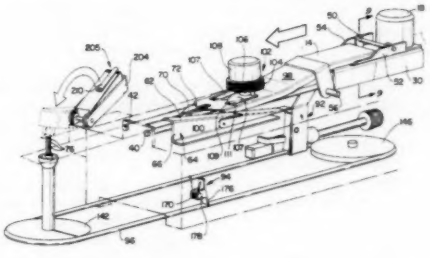
surfaces of said bed and of an arm when said arm is fully rotated over said bed.

6,015,070

PORTABLE BOW MAKING MACHINE

Robert M. Barto, Jr., Palm Beach Gardens, and Ira L. Lopata, Palm Beach, both of Fla., assignors to Cromwell Corporation, Riviera Beach, Fla.

Filed Apr. 5, 1999, Appl. No. 286,567
Int. Cl.[7] A41M *43/00*
U.S. Cl. 223—46 **20 Claims**



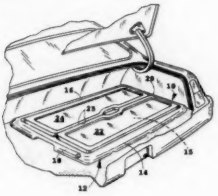
1. A portable bow making machine for making a bow from ribbon comprising a base having a first portion and a second portion, said first portion having a fore end and an aft end, a rail supported to said base extending longitudinally therebetween, a manually operated carriage mounted on said rail for rectilinear movement, a clapper hingedly supported in axial alignment to said carriage, said second portion having an impaler attached to said base adjacent said aft end and extending vertically, said clapper being sufficiently heavy to drop on said impaler when said carriage positions said clapper directly thereover, a longitudinal open-ended channel on the underside of said carriage and said clapper and movable therewith for leading a portion of said ribbon from said fore end to said impaler, a first clutch carried by said carriage engageable with said ribbon for advancing said ribbon a predetermined distance, a belt connected to said impaler for imparting rotary motion thereto, a second clutch operatively connected to said belt for rotating said impaler a predetermined distance when said portion of said ribbon is dropped on and penetrated by said impaler for generating an arc on said ribbon, and a third clutch operatively connected to said belt for preventing said belt from moving in a single direction when said carriage is returned to said fore end.

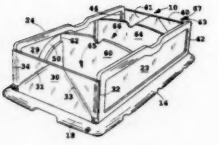
6,015,071

VEHICLE STORAGE DIVIDER

Mark E. Adomeit; Kevin J. Fellows, both of Holland; Philip P. Cannon, Norton Shores; David J. Spykerman, Zeeland, and Rollin E. Nothwehr, Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Mar. 11, 1997, Appl. No. 814,653
Int. Cl.[7] B60R *7/02*
U.S. Cl. 224—42.34 **10 Claims**





1. A collapsible storage divider for a vehicle comprising:

a molded polymeric base having a raised lip extending around the outer periphery thereof;

front and rear walls pivotally mounted to said base within opposite edges of said peripheral lip, wherein said front and rear walls include inside-facing surfaces, each having a tab receiving slot;

end walls mounted to edges of said front and rear walls for collapsing flat as said front and rear walls are folded toward one another to a flat position within said peripheral lip of said base such that said storage member is substantially flat when folded to a stored position; and

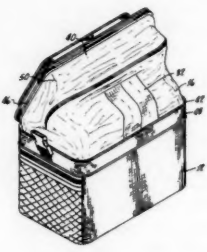
a partition wall for holding said divider in an open position with said front and rear walls and sidewalls in a generally vertically raised position for use, said partition wall pivotally mounted to said base between said front and rear walls and having locking tabs engaging said tab-receiving slots of said front and rear walls for guiding and holding said front and rear walls as said partition is raised from a flat stored position to a substantially vertical position.

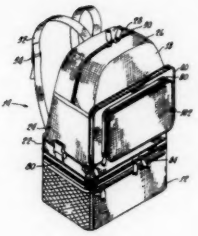
6,015,072

COMBINATION BACKPACK WITH LINED CONTAINER

David Young, Taipei, Taiwan, assignor to G & A Trading Company, City of Industry, Calif.

Filed Sep. 22, 1998, Appl. No. 158,241
Int. Cl.[7] A45F *4/02*
U.S. Cl. 224—153 **21 Claims**





1. A combination backpack and carrying compartment, the combination comprising:

a backpack comprising a back section, a front section, a bottom section attached to the front section and the back section, and a pair of shoulder straps attached to the back section, wherein the backpack is collapsible onto the bottom section thereof;

an upper lid attached to the backpack;

a lid attachment for attaching the bottom section of the backpack and the upper lid when the backpack is collapsed onto the bottom section of the backpack, so that the collapsed backpack is between the bottom section of the backpack and the lid;

a carrying compartment having side walls and a bottom;

a compartment attachment between the side walls of the carrying compartment and the bottom section of the backpack;

a liner having side walls and a bottom wall, wherein the side walls and bottom wall of the liner substantially correspond with the side walls and bottom of the carrying compartment; and

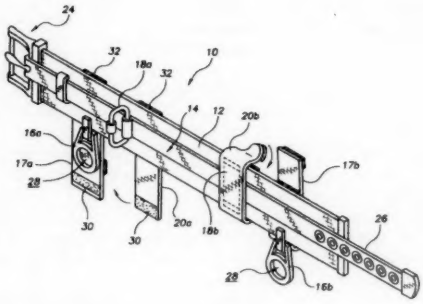
a liner attachment for detachably attaching the side walls of the liner with the side walls of the carrying compartment.

6,015,073

SAFETY UTILITY BELT

Jeffery J. Wojciak, 7438 S. Beloit; David Lis, 6928 Elder Ct., and Timothy Landingham, 9019 Failane Dr., all of Bridgeview, Ill. 60455

Filed Oct. 8, 1998, Appl. No. 168,581
Int. Cl.[7] A45F *5/00*
U.S. Cl. 224—251 **1 Claim**



1. A safety utility belt comprising:

a back belt;

a reflective center belt strip attached to a front surface of and along the length of said back belt;

a buckle assembly extending past a first end of said back belt and secured to one end of said belt strip;

a belt strip end extending past a second end of said back belt and unitarily formed with another end of said belt strip, said belt strip end including a number of openings therethrough for coupling with said buckle assembly to secure said back belt about the waist of a user;

a horizontally pivoting tool retaining ring coupled to said back belt;

a no-snag tool retaining ring safety cover flap having a first end secured to said back belt and being sized to be securable over said tool retaining ring in a manner to prevent snagging of said tool retaining ring;

a vertically pivoting attached D-ring coupled to said back belt; and

a no-snag D-ring safety cover flap having an end secured to said back belt and sized to be securable over said D-ring in a manner to prevent snagging of said D-ring;

said no-snag tool retaining ring safety cover including a storage hook and pile fastener strip that is securable to a companionate section of hook and pile fastener material provided on a back side surface of said back belt when said no-snag tool retaining ring safety cover flap is folded backward against said back side of said back belt in a no-snag storage position;

said no-snag D-ring safety cover flap including a storage hook and pile fastener strip that is securable to another companionate section of hook and pile fastener material provided on said back side surface of said back belt when said no-snag D-ring safety cover flap is folded backward against said back side of said back belt in a no-snag storage position.

6,015,074

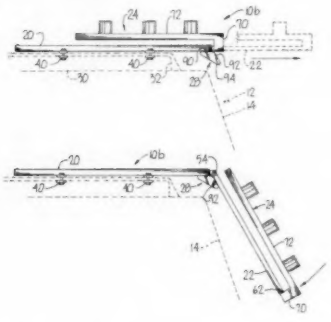
ROOF RACK FOR A VEHICLE

Travis J. Snavely; John F. Braun, and Gerald L. Braun, all of Rte. 2, Box 36, Miltonvale, Kans. 67466

Filed Jul. 1, 1998, Appl. No. 108,261

Int. Cl.[7] B60R *9/042*

U.S. Cl. 224—310 **18 Claims**



1. A roof rack for a vehicle, comprising:

a support member adapted to be detachably secured to a roof of a vehicle;

a telescoping member slidably attached to said support member for movement between a retracted and an extended position, said telescoping member including:

a first segment hinged to a second segment about a horizontal axis, said second segment being free from contact with said support member when said telescoping member is in said extended position, whereby said second segment is selectively rotatable about said horizontal axis;

a generally L-shaped member having a first portion attached to an outer end of said second segment of said telescoping member and a laterally extending second portion extending above and generally parallel to said support member when said telescoping member is in said retracted position whereby said second portion of said L-shaped member is adapted for receiving a load thereon and for spacing the load on said rack above said support member and the vehicle's roof; and

a brace fixed to said support member and supporting said telescoping member when in said extended position to limit the rotation of said second segment of said telescoping member and prevent contact with the vehicle.

6,015,075

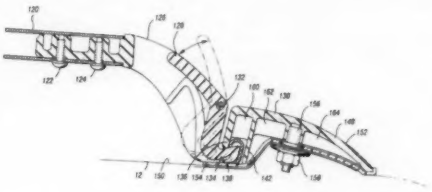
ARTICLE CARRIER ASSEMBLY

Craig Stapleton, Clarkston, Mich., assignor to Advanced Accessory Systems LLC, Sterling Heights, Mich.

Division of application No. 08/683,193, Jul. 18, 1996, Pat. No. 5,791,536. This application Jun. 16, 1998, Appl. No. 97,939.

Int. Cl.[7] B60R *9/04*

U.S. Cl. 224—321 **9 Claims**



1. An article carrier assembly for attachment to a vehicle roof panel, the roof panel having a recessed portion, the article carrier assembly comprising:

a side rail attachable to the vehicle roof panel, said side rail having an outboard portion extending away from the recessed portion and having an outer surface, and an inboard portion extending into the recessed portion, said inboard portion including a support leg and an edge portion defining a track; and

a cross rail, a retainer supporting said cross rail having a latch connected thereto, said latch being engageable with said edge portion for securing the retainer in discrete positions along the side rail, said retainer having a foot retained in said inboard portion track and being substantially hidden behind said outer surface when viewed from a position alongside the vehicle wherein said foot has a loop portion extending in a channel defined between said support leg and said edge portion.

6,015,076

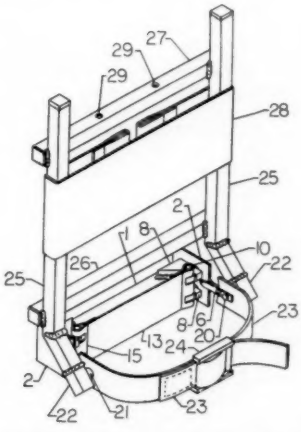
BRIDGING HIPBELT FOR A BACKPACK

Daryl Pennington, 123 Blair #C, Rock Springs, Wyo. 82901

Filed Jun. 20, 1997, Appl. No. 879,618

Int. Cl.[7] A45F *3/04*

U.S. Cl. 224—637 **13 Claims**



1. A rear panel of a hipbelt for a backpack, the backpack having two spaced y pivots attached thereto configured to be located adjacent respective sides of an individual when the backpack is worn by the individual, wherein the two y pivots lie in a plane substantially parallel to a y axis and are substantially coaxial,

wherein the y axis is in a horizontal plane and is perpendicular to a line of horizontal travel in which the individual which carries the backpack travels, the y pivots being located forwardly of the back of the individual when the backpack is worn, said rear panel for the hipbelt comprising:

a substantially rigid cross piece;

a cushion;

means for attaching said cushion to said cross piece;

pivot connecting means for respectively connecting said cross piece to the two y pivots, wherein said cross piece and said cushion are located rearwardly of the two y pivots and said cushion is configured to engage the lower back of the individual, and wherein said pivot connecting means allow pivotal movement of said cross piece and said cushion with respect to the backpack when worn.

6,015,077

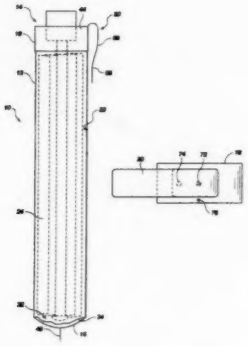
HANDS-FREE PROTECTIVE CARRIER FOR AN UMBRELLA

Michael J. Disher, 6440 Stoneridge Mall Rd., Apt. K-116, Pleasanton, Calif. 94588

Filed Jun. 30, 1997, Appl. No. 885,748

Int. Cl.[7] **A45B** *25/18*

U.S. Cl. 224—666 **10 Claims**



1. A hands-free umbrella carrier configured for retaining an umbrella on a user's apparel or about a user's body comprising:

a flexible tubular sleeve sized to receive and enclose an umbrella, said flexible tubular sleeve having an open end for receiving an umbrella and an entirely flexible closed end;

a stabilizing collar attached to said open end of said flexible tubular sleeve to provide an opening to said flexible tubular sleeve, said stabilizing collar having at least two bands of semi-flexible material joined at their respective ends by spring-loaded pivot pins which operate to move the bands relative to each other to provide a first open position and a second closed position, the movement of said bands being achievable by manipulation with one hand; and

an attachment member positioned on said stabilizing collar constructed to slidingly attach to a supporting surface for carrying the hands-free carrier near a wearer's body, said attachment member being rotatably secured to said stabilizing collar in a manner whereby said attachment member may be selectively adjusted from a position perpendicular to said stabilizing collar for enabling insertion of an umbrella into said flexible tubular sleeve while said flexible tubular sleeve is attached to a user's apparel to a second position in parallel alignment with said stabilizing collar to thereby provide a smaller size and dimension of said stabilizing collar and attachment member for storage of said umbrella carrier.

6,015,078

RETRACTABLE BARREL-HOLDING PLUG FIXING APPARATUS

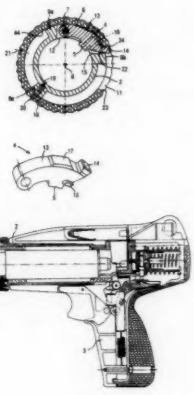
Roland Almeras, Tournon, and Patrick Herelier, Saint Jean de Muzols, both of France, assignors to Societe de Prospection et d'Inventions Techniques Spit, Cedex, France

Filed Apr. 2, 1998, Appl. No. 53,351

Claims priority, application France, Apr. 2, 1997, 97 03990

Int. Cl.[7] **B25C** *1/08; 1/18*

U.S. Cl. 227—10 **6 Claims**



1. Plug fixing apparatus comprising a barrel holder, and barrel and retractable holding means for selectively holding the barrel in the barrel holder and allowing the barrel to slide between a propellant charge loading position and a firing position wherein said retractable holding means includes a holding a having a holding finger mounted on the barrel holder to pivot about an axis parallel to an axis of the barrel holder, and a ring mounted to rotate on the barrel holder about the axis of the barrel holder to thereby pivot said holding finger into and out of locking engagement with said barrel, said ring being engageable with said holding arm in each opposite rotational direction of the ring to positively contact said holding arm to induce said pivoting movement of said holding finger during ring rotation;

wherein the holding arm has a cam surface engageable with the ring in such a manner that the rotation of the ring displaces the holding finger between a release position of the barrel and a holding position of the barrel, in which the holding finger projects into an interior of the barrel holder;

said rind includes an opening and the holding arm comprises a release head (**14**; **35**) extending into the opening;

wherein the release head has an inclined face and said ring opening has circumferentially spaced release and locking edges wherein the release edge is adapted to be rotated into contact with the inclined face to pivot the holding arm into the release position.

6,015,079

POSITIONING DEVICE FOR CONTROLLING THE POSITION OF A WORKPIECE IN A HORIZONTAL PLANE

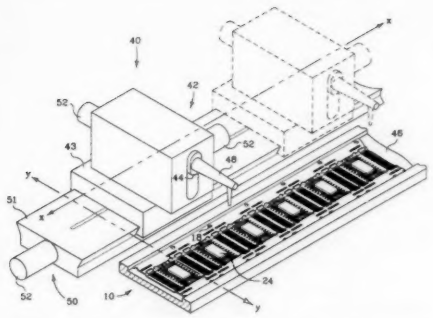
Rich Fogal, and Michael B. Ball, both of Boise, Id., assignors to Micron Technology, Inc.

Division of application No. 08/574,156, Dec. 18, 1995, Pat. No. 5,813,590. This application Aug. 4, 1997, Appl. No. 905,183.

Int. Cl.[7] **H05K** *13/06*

U.S. Cl. 228—4.1 **8 Claims**

1. A wire bonding machine, comprising a bond head movable in one plane at two different rates in a first direction and at least one



rate in a second direction perpendicular to the first direction.

6,015,080

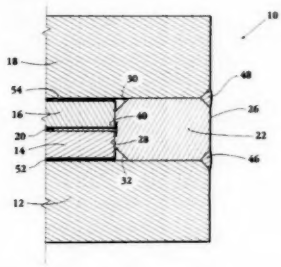
METHOD OF MANUFACTURING CLAD METAL PLATES

William C. Turner, 85 Pinto La., Sedona, Ariz. 86336

Filed Apr. 1, 1997, Appl. No. 829,985

Int. Cl.[7] B23K *20/00;31/02*

U.S. Cl. 228—158 **4 Claims**



1. A method of manufacturing clad metal plate products employing:

a bottom base plate, a first cladding plate, a second cladding plate and a top base plate, the peripheral dimensions of the cladding plates being less than the peripheral dimensions of the base plates comprising the steps of:

(1) applying cladding activator to a surface of each of said cladding plates, the cladding activator being selected from Ni4P and Ni6P;

(2) assembling said bottom base plate, said first cladding plate, a separator compound, said second cladding plate and said top base plate in stacked array with said surface of said first cladding plate having said cladding activator in contact with a surface of said bottom base plate and said surface of said second cladding plate having said cladding activator in contact with a surface of said top base plate and with said separator compound between said first and second cladding plates;

(3) positioning a metal rail between said base plates and circumferentially of said cladding plates;

(4) welding said base plates to said rail to form an assembly having a closed environment encompassing said cladding plates;

(5) removing from said closed environment substantially all water and oxygen by evacuating said close environment followed by charging said closed environment with a dry inert gas followed by again evacuating said closed environment while heating the assembly to a temperature of about 250° F., the closed environment being evacuated to about 10^{-3} millibars to form a closed substantially oxygen and water free environment;

(6) heating said closed assembly to at least the solidus temperature of said cladding activator;

(7) hot rolling said assembly while heated to compress said assembly to desired width, length and thickness to cause said first cladding plate to bond to said bottom base plate and said second cladding plate to bond to said top base plate; and

(8) disassembling said assembly at said separator compound layer to provide a first and a second clad plate.

6,015,081

ELECTRICAL CONNECTIONS USING DEFORMING COMPRESSION

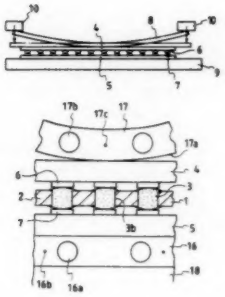
Takahiro Okabayashi, Tokyo; Tetsuo Yoshizawa, Yokohama; Toyohide Miyazaki, Ibaraki-ken; Hiroshi Kondo, Yokohama; Yoshimi Terayama, Odawara; Takashi Sakaki, Tokyo; Yuichi Ikegami, Osaka; Kazuo Kondo, Tokyo; Yoichi Tamura, Tokyo, and Yasuo Nakatsuka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, and Sumitomo Metal Industries, Ltd., both of Japan

Continuation of application No. 07/841,016, Feb. 25, 1992, abandoned. This application Mar. 7, 1994, Appl. No. 206,270.

Claims priority, application Japan, Feb. 25, 1991, 3-53903; Mar. 9, 1991, 3-69089; Mar. 27, 1991, 3-89826; Mar. 27, 1991, 3-89827; May 21, 1991, 3-146944

Int. Cl.[7] B23K *31/02*

U.S. Cl. 228—180.22 **4 Claims**



1. A method for electrical connection between electrical joints of electric circuit components via an electrical connecting member having a plurality of conductive members carried on a carrier in a mutually insulating state, one end of each said conductive member being exposed to one face of said carrier and the other end of said each conductive member being exposed to the other face of said carrier, including:

deforming said each conductive member by successively compressing portions of said electric circuit components with said electrical connecting member sandwiched therebetween so that a deformation ratio of the diameter of the portion of said each conductive member exposed from a face of said carrier is equal to or more than 17%, where the deformation ratio is an increase in conductive member diameter as a percentage of said diameter before compression, to make a thermocompression bond between each electrical circuit component and the conductive members of said electrical connecting member by applying heat to the successively compressed portion of said electrical circuit component, said compression securely causing a metal diffusion in the electrical circuit components and the conductive members to join the electrical circuit components and the conductive members.

6,015,082

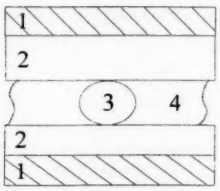
METHOD FOR JOINING METALS BY SOLDERING

Jorma Kivilahti, Kuhatie 11 B 6, FIN-02170 Espoo, Finland

Filed Oct. 17, 1996, Appl. No. 733,665

Int. Cl.[7] H05K *3/34*

U.S. Cl. 228—180.22 **5 Claims**



1. Joining method of electronics components, wherein the surfaces to be connected are coated with thin layers of metals or alloys, the components are compressed together and the coated surfaces are heated above the temperature at which the coatings will melt and form solder joints between the contact areas, wherein the joining method comprises that the contact areas of the conductors are coated with two different metals layers, of which a base coating is tin or tin-indium alloy and a top coating is bismuth or bismuth-tin alloy and that the thickness of the base coating is between 10–50 μm, that the thickness of the top coating is less than 10 μm and that the joining occurs in a temperature range of 140–180° C.

6,015,083

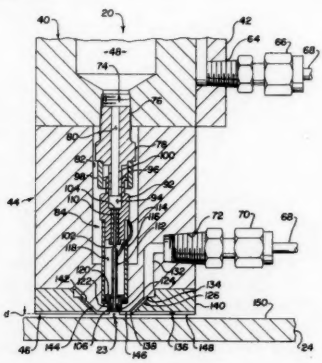
DIRECT SOLDER BUMPING OF HARD TO SOLDER SUBSTRATE

Donald J. Hayes, Plano; Michael T. Boldman, Murphy, and Virang G. Shah, Plano, all of Tex., assignors to MicroFab Technologies, Inc., Plano, Tex.

Continuation-in-part of application No. 08/581,273, Dec. 29, 1995, Pat. No. 5,772,106. This application Jan. 27, 1997, Appl. No. 789,640.

Int. Cl.[7] B23K *1/00;31/02*

U.S. Cl. 228—254 **18 Claims**



1. A process for applying solder bumps to a hard to solder substrate, comprising the steps of:

melting a modified solder composition comprising a solder base alloy modified by alloying with a light reactive metal in an amount effective to wet and bond to a hard to solder pad surface, selected from the group consisting of aluminum, and aluminum alloy, and indium tin oxide, to make a solder interconnect on a microelectronic part;

heating the surface of the pad;

creating and maintaining an inert gas atmosphere over the pad;

producing a microdrop of the modified solder composition within the inert gas atmosphere;

applying the microdrop to the heated surface of the pad while maintaining the inert gas atmosphere; and

freezing the microdrop in electrical and mechanical contact with the surface of the pad.

6,015,084

SET OF BLANKS, BOX, METHOD AND MACHINE FOR MAKING A BOX FROM SAID SET OF BLANKS

Gérard Mathieu, Cergy, and Didier Desertot, Dijon, both of France, assignors to OTOR, Paris, France

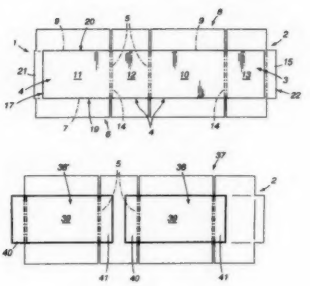
PCT No. PCT/FR97/00113, § 371 Date Jul. 21, 1998, § 102(e) Date Jul. 21, 1998, PCT Pub. No. WO97/27114, PCT Pub. Date Jul. 31, 1997

PCT Filed Jan. 21, 1997, Appl. No. 117,348

Claims priority, application France, Jan. 22, 1996, 96 00677

Int. Cl.[7] B65D *5/54;5/56;* **B31B** *7/00*

U.S. Cl. 229—122.32 **42 Claims**



1. Set (**1**, **32**, **37**, **43**, **48**, **52**, **58**, **69**, **72**, **78**, **91**, **110**) of blanks for constructing a packaging box, comprising at least two blanks made of a material in the form of sheets of board or corrugated board, namely a first blank (**2**, **48**, **59**, **81**, **126**, **140**) comprising a series of at least four principal leaves (**4**; **85**, **86**, **87**, **86'**) ending in a fixing tab (**15**, **15"**, **61**), said principal leaves and said tab being connected to each other via first fold lines (**5**) parallel to each other, directly or via intermediate leaves, which series is provided on one side with a first series (**6**, **82**) of flaps connected to said series of principal leaves by second fold lines (**7**) perpendicular to said first fold lines, said series of leaves being able to form a ring of walls for the box and a second blank (**3**, **24**, **33**, **38**, **38'**, **44**, **49**, **53**, **63**, **73**, **79**, **92**, **111**, **127**, **141**) comprising at least two panels (**10**, **11**, **12**, **13**; **25**, **26**; **39**, **40**, **41**; **45**, **46**, **47**; **49**; **55**, **56**; **64**, **65**, **66**, **67**, **68**; **74**, **75**, **76**; **94**, **96**, **97**; **112**, **114**, **116**, **117**, **118**, **119**) connected together by a third fold line (**14**, **74'**, **95**, **113**), namely a first panel and one or more second panels, characterized

in that the second blank overlaps at least one fold line of the first blank,

in that the first panel is fixed and/or centered on the first blank,

in that said second panel or at least one of said second panels is fixed to said first blank by means (**83**, **83'**, **84**, **84'**, **88**, **89**) arranged so as to permit relative movement of said second panel or panels with respect to the first blank when the box is being formed by a simultaneous rolling up of said prejoined blanks around a volume (**161**) of defined dimensions, and

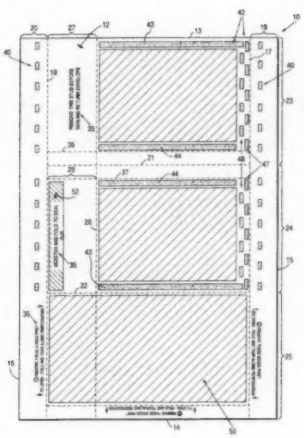
in that the third fold line or lines (**14**, **74'**, **95**, **113**) of the second blank are laid out and positioned with respect to the corresponding fold lines of the first blank in order to enable the extra thicknesses of the sheets of board to be compensated for during said rolling up.

6,015,085

COHESIVE PATTERN FOR A CONTINUOUS Z-FOLD MAILER WITH REPLY ENVELOPE

Terry K. Cannon, St. George, Utah, and Tricia E. Sharp, Iowa City, Iowa, assignors to Moore U.S.A. Inc., Grand Island, N.Y.

Filed Feb. 9, 1999, Appl. No. 246,957
Int. Cl.[7] B65D *27/06*
U.S. Cl. 229—305 20 Claims



1. A mailer type business form intermediate, including a reply envelope, comprising:

a substantially quadrate sheet of paper having first and second faces, top and bottom edges substantially parallel to each other, and first and second side edges substantially perpendicular to said top and bottom edges and substantially parallel to each other;

first and second lines of weakness formed in said sheet adjacent, but spaced from and substantially parallel to, said first and second side edges, respectively, to define first and second removable side margin portions;

a first fold line formed in said sheet substantially parallel to said top and bottom edges, and defining said sheet into panels on opposite sides thereof;

a first pattern of pressure activated cohesive in each of said removable side margin portions on at least said second face, said first pattern on said first and second faces being configured and dimensioned to substantially prevent blocking when said intermediate is laid face-to-face with other intermediates in a fan-fold configuration;

a second pattern of pressure activated cohesive formed in said panels on opposite sides of said first fold line for defining three edges of a reply envelope, said second pattern of pressure activated adhesive configured, dimensioned, and positioned so that blocking is substantially avoided when said intermediate is brought into face-to-face engagement with other intermediates in a fan-fold configuration; and

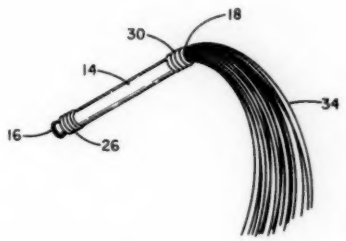
an activatable pattern of adhesive provided on one of said panels of said second face to seal a fourth edge of said reply envelope distinct from said first through third edges.

6,015,086

WHIP WITH A BRAIDED HANDLE AND METHOD OF FABRICATION

Steven D. Ritchie, 368 Bay Plz., Treasure Island, Fla. 33706, and Harlie David Reynard, 5054 Johns Pass Ave., Madera Beach, Fla. 33708

Filed Jul. 2, 1998, Appl. No. 109,720
Int. Cl.[7] B68B *11/00*
U.S. Cl. 231—2.5 7 Claims



1. A new and improved whip comprising, in combination:

a generally cylindrical handle portion being about 8 inches in length and about ¾ inch diameter, the handle portion having an inboard end and an outboard end and being fabricated of a braided rope construction comprising a plurality of single yarns twisted together to form a plurality of piled yarns which are then braided, with a helical angle of the twist of the single yarns within their respective plied yarn being equal and opposite to the helical angle of the plied yarns in the braid;

an inboard first thread wrapped circumferentially about the handle end from adjacent the inboard end and extending outboardly for an axial length of about ¾ of an inch an outboard second thread wrapped circumferentially around the handle portion and extending for a length of about ¾ of an inch thereby providing a handle length of about 6¼ inch between the first and second threads; and

a whipping portion extending outboardly of the outboard end of the handle portion, the whipping portion being fabricated of extensions at the braided strands from the handle portion but in an unbraided braid form and extending for a length of about 16 inches.

6,015,087

APPARATUS AND METHOD FOR LEASING DOCUMENTS OF VALUE

Dean Alan Seifert, Aurora; Earney Stoutenburg, and Paul J. Vogt, both of Highlands Ranch, all of Colo., assignors to First Data Corporation, Hackensack, N.J.

Filed Oct. 4, 1996, Appl. No. 726,133
Int. Cl.[7] G06F *15/30*
U.S. Cl. 235—379 33 Claims

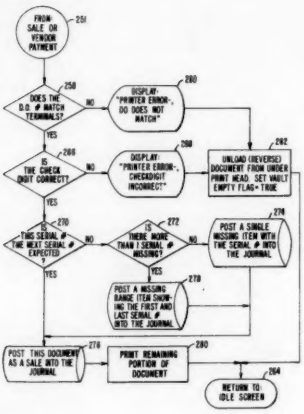
1. An apparatus for issuing documents of value, comprising:

a compartment for receiving substrates, each substrate having an associated code, wherein the codes are uniquely associated with the substrates;

a code reader, the code reader reading the codes associated with the substrates from the substrates;

a printer, the printer generating documents of value by printing information on the substrates; and

a control terminal for controlling the code reader and printer, the control terminal configured for communication with the code reader and the control terminal further configured for detection and recordation of the codes uniquely associated with the substrates, wherein the control terminal detects and records deviations from an expected order of the codes uniquely



associated with the substrates upon the substrates being received in the apparatus.

6,015,088

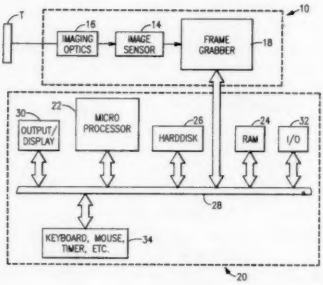
DECODING OF REAL TIME VIDEO IMAGING

James A. Parker, Camillus, and Michael A. Ehrhart, Liverpool, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Provisional application No. 60/030,360, Nov. 5, 1996. This application Nov. 4, 1997, Appl. No. 964,341.

Int. Cl.[7] G06K *7/10*

U.S. Cl. 235—462.01 **25 Claims**



14. A process for capturing and decoding bar-coded information in real time from a continuously displayed video signal of a target of interest, said process comprising the steps of:

aiming an imaging apparatus at a target of interest;

continually displaying a real time image of said target obtained from said imaging apparatus;

selectively capturing an instantaneous displayed image of said target and storing said image into computer memory;

determining if bar-coded information is present in said captured and stored image;

decoding all bar-coded information present in said captured and stored image while continually displaying said real time image of said target; and

outputting the decoded bar-code information onto said real time displayed image.

6,015,089

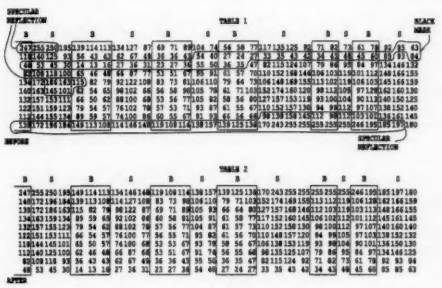
HIGH SPEED IMAGE ACQUISITION SYSTEM AND METHOD OF PROCESSING AND DECODING BAR CODE SYMBOL

Kurt Hecht, Hartsville; Milorad Neskovic, Hatfield; Vasanth Shreesha, Quakertown, all of Pa., and Edward Cohen, Mt. Laurel, N.J., assignors to Accu-Sort Systems, Inc., Telford, Pa.

Continuation of application No. 08/660,152, Jun. 3, 1996. This application Apr. 7, 1999, Appl. No. 287,448.

Int. Cl.[7] G06K *7/10*

U.S. Cl. 235—462.16 **19 Claims**



10. An apparatus for correcting imperfections in scanned data for use in decoding coded symbologies, the apparatus comprising:

means for generating a table of scanned data having rows and columns corresponding to an area of a coded symbology, the coded symbology having a first dimension reflecting the encoded information and a second dimension, where the rows of scanned data correspond to the first dimension and the columns of scanned data correspond to the second dimension of the coded symbology area;

means for sorting each column based on the magnitude of the data within each column; and

means for decoding the encoded information based on a center row of data after the data column sorting.

6,015,090

HAND MOUNTABLE ADAPTIVE BARCODE SCANNER

Jerome Swartz, Old Field; Edward Barkan, Miller Place; Glenn S. Spitz, Far Rockaway; Joseph Katz, and Boris Metlitsky, both of Stony Brook, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Continuation of application No. 08/415,503, Apr. 3, 1995, abandoned, and a continuation-in-part of application No. 07/562,130, Aug. 3, 1990, Pat. No. 5,151,580, and application No. 07/553,559, Jul. 16, 1990, abandoned, said application No. 08/415,503 is a division of application No. 08/317,775, Oct. 4, 1994, which is a continuation of application No. 07/897,835, Jun. 12, 1992, abandoned, which is a continuation of application No. 07/260,692, Oct. 21, 1988, Pat. No. 4,933,538. This application Jul. 11, 1997, Appl. No. 893,669.

Int. Cl.[7] G06K *7/10*

U.S. Cl. 235—472 **16 Claims**

1. A hand-mountable data processing device comprising:

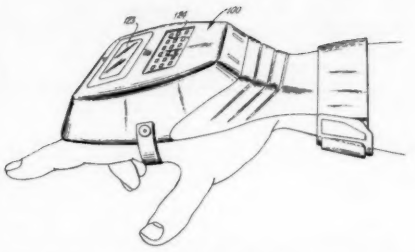
a housing mountable on the back of a user's hand, the housing having two side panels arranged to lie perpendicular to a palm of the hand and attached to a top panel arranged to lie parallel to the palm of the hand;

a palm strap capable of extending around the palm of the hand and fastening at each of two ends of the strap to the two side panels, wherein one end of the palm strap is pivotally fastened to one of the side panels;

a wrist strap connected to the top panel and capable of extending around the wrist of the user;

a data entry member mounted on the top panel;

a display mounted on the top panel for displaying data; and



communications interface for providing communication between the data entry member, the display and devices external to the data processing device.

6,015,091

SYSTEM FOR READING BAR CODE SYMBOLS USING PORTABLE BAR CODE SYMBOL READERS HAVING ONE-WAY RF SIGNAL TRANSMISSION LINKS WITH BASE STATIONS

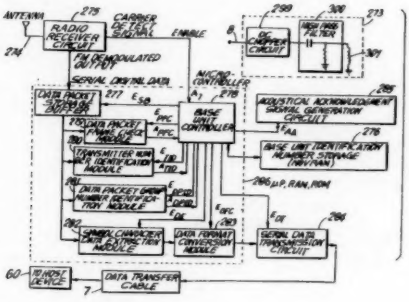
George B. Rockstein, Audubon; David M. Wilz, Sewell, both of N.J.; Stephen J. Colavito, Brookhaven, Pa.; Gene German, Voorhees, and Carl Harry Knowles, Morestown, both of N.J., assignors to Metrologic Instruments, Inc., Blackwood, N.J.

Continuation-in-part of application No. 07/898,919, Jun. 12, 1992, Pat. No. 5,340,973, application No. 07/761,123, Sep. 17, 1991, Pat. No. 5,340,971, and application No. 07/821,917, Jan. 16, 1992, abandoned, and a continuation of application No. 08/292,237, Aug. 17, 1994, Pat. No. 5,808,285, said application No. 07/761,123 is a continuation-in-part of application No. 07/583,421, Sep. 17, 1990, Pat. No. 5,260,553. This application Jul. 9, 1997, Appl. No. 890,576.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06K** *7/10*

U.S. Cl. 235—472.01 **8 Claims**



1. A system for reading code symbols comprising:

(A) a plurality of code symbol reading devices, each said code symbol reading device including

means for automatically scanning a code symbol on an object,

means for automatically producing symbol character data in a form representative of said scanned code symbol,

mean for synthesizing a group of data packets, each having a plurality of data fields containing codes for identifying the code symbol reading device synthesizing said data packet in said group thereof, a data packet number for identifying each said data packet, a data packet group number for identifying the group to which each said data packet belongs, and a sequence of digital data bits representative of said symbol character data, and

means for generating a carrier signal of electromagnetic nature, having a frequency modulated by the digital data bits representative of said group of data packets, and transmitting said modulated carrier signal over a predetermined data transmission range in free space,

wherein the frequency of the carrier signal produced by each said code symbol reading device is substantially the same and equal to a preselected frequency value; and

(B) a plurality of base units, each said base unit being assigned to one said code symbol reading device, and positionable within the predetermined transmitting range thereof, and including

means for receiving a modulated carrier signal transmitted from said any one of said code symbol reading devices,

means for demodulating any one of the received modulated carrier signals so as to recover at least one data packet therefrom,

means for analyzing said recovered data packet to determine whether the received data packet was synthesized by its assigned code symbol reading device, and if so, then recovering said symbol character data therefrom,

means for buffering said symbol character data recovered from the data packet synthesized by said preassigned code symbol reading device, and

means for automatically producing, in response to the recovery and buffering of said symbol character data, an acknowledgement signal perceptible to the user of said assigned code symbol reading device when said user is situated within said predetermined data transmission range, so as to inform the user of said code symbol reading device that said symbol character data produced thereby has been received and recovered at said assigned base unit.

6,015,092

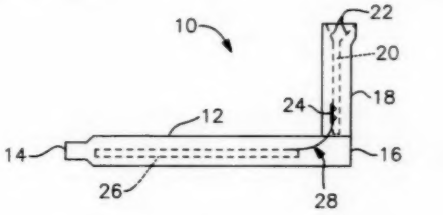
SMART CARD READER HAVING ANGLED SMART CARD HOLDER

William M. Postlewaite, 262 South Beach Dr., Tarpon Springs, Fla. 34689, and Stephen A. Ewald, 2612 West Granada St., Tampa, Fla. 33629

Filed Feb. 5, 1998, Appl. No. 19,223

Int. Cl.[7] **G06K** *7/00*

U.S. Cl. 235—486 **5 Claims**



1. A smart card reader, comprising:

a PCMCIA card disposed in a first plane, said PCMCIA card having a leading end and a trailing end;

a smart card holder disposed in a second plane substantially normal to said first plane;

said smart card holder having a leading end connected to said PCMCIA card adjacent said trailing end of said PCMCIA card and said smart card holder having a free trailing end adapted to slidingly receive a smart card;

said smart card holder including electrical contact means adapted to conductively contact a smart card received within said smart card holder;

a printed circuit board housed within said PCMCIA card; and

flexible conductor means extending from said electrical contact means in said smart card holder to said printed circuit board;

whereby connector means may be attached to an adjacent PCMCIA card without physical blockage by said smart card reader;

whereby insertion of a smart card into said smart card holder is facilitated; and

whereby a modem may be housed within said PCMCIA card at the same time a smart card is positioned within said smart card holder.

6,015,093

TRANSFER DEVICE FOR TRANSFERRING DATA BETWEEN AN ELECTRONIC DATA PROCESSING DEVICE AND A CARD

Paul Barrett, Worcester Park, United Kingdom, and Raymund Eisele, Idstein, Germany, assignors to Smartdiskette GmbH, Idstein, Germany

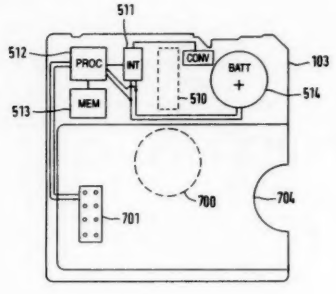
Continuation of application No. 08/514,382, Aug. 11, 1995, which is a continuation-in-part of application No. 08/170,166, filed as application No. PCT/EP92/01356, Jun. 16, 1992, Pat. No. 5,584,043. This application Jun. 24, 1999, Appl. No. 339,680.

Claims priority, application Germany, Jun. 26, 1991, 4121023

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06K *5/00*

U.S. Cl. 235—492 **21 Claims**



1. A tansfer device for use in transferring data between an electronic data processing device having a diskette station including a read/write device normally used to read magnetic media and a removable card having a storage device for storing data, said transfer device comprising:

a frame having an exterior form designed to accommodate said removable card, and including an insertion port receiving the card, the exterior form of said frame being substantially the same as that of a diskette to allow insertion of said frame into a diskette station of an electronic data processing device;

a first interface included at least partially within said frame and operable to transfer data between said transfer device and said electronic data processing device through said read/write device in the diskette station of said electronic data processing device normally used to read magnetic media;

processing circuitry disposed within said frame and coupled to said first interface for controlling transfer of data from said card to said transfer device; and

a second interface coupled to said processing circuitry and disposed within said frame for coupling data from said card for transfer of data from said card to said data transfer device.

6,015,094

VEHICLE PERFUME DISPENSER

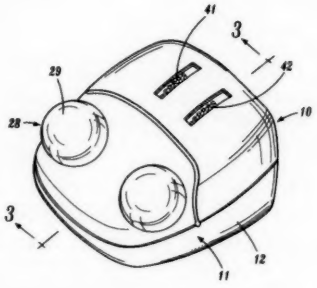
Sze Pik Por, 6 General Lim St., San Antonio Village, Pasig City, Philippines, 16000

Filed Nov. 19, 1997, Appl. No. 974,373

Claims priority, application Philippines, May 9, 1997, S.N.I.-56394

Int. Cl.[7] A24F *5/00*

U.S. Cl. 239—44 **5 Claims**



1. A vehicle perfume dispenser adapted to be placed on top of a vehicle dashboard comprising:

a bottom case member having a perfume cartridge receptacle disposed at a front portion of said bottom case member and at least one pair of pin holder casings secured thereto;

a rear upper cover mounted at an upper rear portion of said bottom case member and having at least a pair of longitudinally disposed slots;

a see-sawing member adapted to be pivotally mounted on said bottom case member and having a rectangular slot and a counterweight;

a flapping cover secured at a front portion of said see-sawing member and having at least one equilibrium adjusting means; and

oscillating means rotatively held within said rectangular slot and having a tilting clearance adjustment means that includes at least one stopper member and one tilting member projecting upwardly through said rectangular slot.

6,015,095

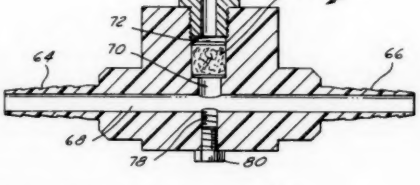
POWDER PAINT COAT PRESSURE MONITORING DEVICE

Danny Baioff, Tecumseh; David A. Tiessen, Cottam, and Gil Boucher, Tecumseh, all of Canada, assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 28, 1998, Appl. No. 143,247

Int. Cl.[7] B67D *5/08*

U.S. Cl. 239—71 **1 Claim**



1. A powder spraying apparatus, comprising:

a source of powder;

a pump for pumping powder from said source of powder;

a powder feed line receiving said powder from said pump;

an applicator receiving said powder from said feed line;

a pressure gauge assembly communicating with said feed line between said pump and said applicator; said gauge assembly comprising a fitting having an inlet for receiving said powder, an outlet for exhausting said powder and a channel interconnecting said inlet and said outlet, a gauge line communicating with said channel, a pressure gauge communicating with said gauge line and a porous filter located in said gauge line between said channel and said pressure gauge; wherein said fitting further comprises a pocket and wherein said filter is held in said pocket; wherein said pocket comprises a bore and further comprising a hose fitting disposed in said bore and having a flow path formed therethrough thereby providing fluid communication between said channel and said gauge; wherein said bore comprises a threaded bore, said hose fitting comprises a threaded hose fitting threaded into said threaded bore and said filter is held in said bore by said threaded hose fitting; and

a normally closed knock-out bore aligned with said pocket for providing access to said pocket for removal of said filter.

6,015,096

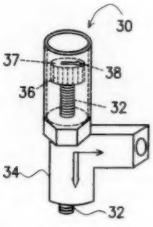
SPEED CONTROLLER WITH SCALES

Kuo-Feng Huang, Chu-Pei; Kuo-Chen Wang, Hsinchu Hsien; Hsien-Jung Hsu, Kaohsiung, and Hung-Lung Ma, Miao-Li Hsien, all of Taiwan, assignors to United Microelectronics Corp., Taipei, Taiwan

Filed Oct. 28, 1998, Appl. No. 181,100

Int. Cl.[7] B67D *5/08*

U.S. Cl. 239—73 **11 Claims**



1. A speed controller with scales, used to adjust the amount of an air flow thereby to control the amount of a chemical liquid sprayed, the speed controller comprising:

a housing;

a controller body partly inserted in the housing and having a rotary button which is located at one end thereof and outside the housing, wherein the rotary button has a slot and an indicator thereon, and the indicator is located at one end of the slot; and

a transparent tube enclosing the rotary button, which has a vertical scale on the side thereof and a circular scale on the top circumference thereof.

6,015,097

FLOOR COATING MACHINE

Theron A. VanPutten, 7645 Timber Bluff, SE., Ada, Mich. 49301

Continuation-in-part of application No. 08/619,809, Mar. 15, 1996, abandoned. This application May 29, 1998, Appl. No. 87,543.

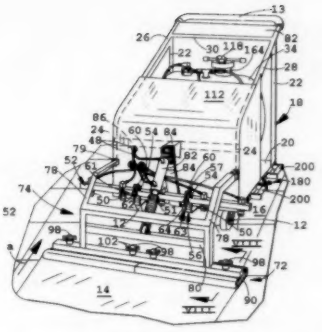
Int. Cl.[7] B05B *1/16*

U.S. Cl. 239—164 **27 Claims**

1. A self-contained movable machine for applying a liquid coating to a floor, comprising:

a frame;

a vessel for holding a supply of the liquid;



at least one bracket having a first portion secured with respect to the frame and a second portion extending vertically from said first portion at a position displaced from the frame;

at least one spray nozzle disposed above and oriented generally orthogonal to said floor, said nozzle arranged to spray a dispersion of the liquid in a spray pattern disposed in a plane oriented generally perpendicular to the floor and to the direction of movement of the machine, and a manifold system extending between said vessel and said at least one spray nozzle to convey the liquid to said spray nozzle; and

a nozzle support member carrying said at least one nozzle and positioning it in said generally orthogonal orientation, said support member being adjustably attached to said bracket for selectively positioning said at least one nozzle at selected different heights while maintaining substantially the same said orientation of said nozzle, including a predetermined height at which said at least one spray nozzle sprays the liquid onto the floor in a pattern of selected size.

6,015,098

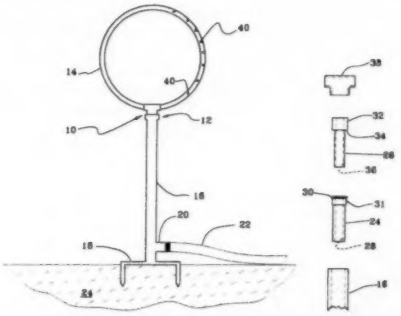
CONNECTOR FOR LAWN SPRINKLER

Gerald Krueger, 106 Lyon St., Marquette, Wis. 53947

Filed Oct. 13, 1998, Appl. No. 170,743

Int. Cl.[7] B05B *3/06;15/06*

U.S. Cl. 239—261 **3 Claims**



1. A connector for a rotatable lawn sprinkler for mounting on a vertically disposed, cylindrical stand pipe having a cylindrical wall, comprising: a cylindrical sleeve having an open-ended longitudinal bore and terminating at one end with an outwardly extending annular shoulder, said sleeve adaptable for coaxial disposition with the stand pipe such that said shoulder is seatable on a marginal wall of the stand pipe and securable thereto; a cylindrical stem having an open-ended longitudinal bore and terminating near one end with an outwardly extending annular collar, said stem co-axially disposed and slidably engagable with said sleeve so as to be freely rotatable, said annular collar supportably engaged with

said annular shoulder, and said stem adaptable for engaging the rotatable lawn sprinkler; whereby, water supplied to the stand pipe and through said bores effects common rotation of said stem and the lawn sprinkler.

6,015,099

METHOD AND APPARATUS FOR SPRAYING PRESSURIZED WATER

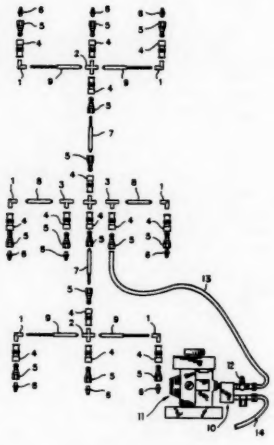
Lawrence E. Ducey, Silver Spring, Md., assignor to Potomac Rain Room, Inc., Jessup, Md.

Continuation-in-part of application No. 08/238,539, May 4, 1994, Pat. No. 5,540,383, which is a continuation-in-part of application No. 08/236,000, Dec. 10, 1993, abandoned. This application Jul. 1, 1996, Appl. No. 673,502.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B05B *1/16*

U.S. Cl. 239—266 **11 Claims**



1. A spray apparatus comprising:

a source of pressurized water;

a substantially vertical tube having an inlet at one end thereof for receiving pressurized water, and a plurality of nozzles attached thereto; and

means for supporting said vertical tube; and

each of said nozzles having an equivalent orifice diameter in the range of 0.026 to 0.076 inches for producing a mist having droplets in the range of 85 to 200 microns;

wherein the source of pressurized water provides a pressure of 600 psi or greater.

6,015,100

FOAM GENERATING NOZZLE ASSEMBLY WITH INTERCHANGEABLE NOZZLE TIP

Mario J. Restive, Frankfort, N.Y., assignor to The Fountainhead Group, Inc., New York Mills, N.Y.

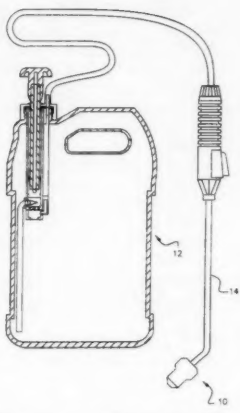
Provisional application No. 60/052,585, Jul. 15, 1997. This application Jul. 14, 1998, Appl. No. 114,766.

Int. Cl.[7] B05B *7/30*

U.S. Cl. 239—428.5 **14 Claims**

1. A spray foaming nozzle assembly for releasably engaging a conduit, comprising:

(a) an elongate housing having a central aperture therethrough, a first end of the housing configured to releasably engage the conduit, and a second end of the housing including a stop, the housing including at least one radial port;



(b) a nozzle tip having a shoulder for engaging the stop, the nozzle tip sized to be slidably disposed into the housing to seat against the stop;

(c) a throat having a divergent end and a convergent end, the throat sized to be slidably disposed within the housing to contact the divergent end with the nozzle tip; and

(d) a venturi nozzle/deflector sized to be disposed within the housing to contact the convergent end of the throat and having a deflector portion operably aligned with the radial port in the housing.

6,015,101

BURNER SYSTEM

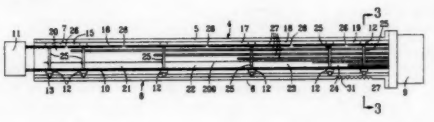
Mark Williamson, Mobberley, and Derek Davies, Poynton, both of United Kingdom, assignors to APV UK Ltd., United Kingdom

Continuation of application No. 08/535,231, filed as application No. PCT/GB94/00969, May 5, 1994, abandoned. This application May 30, 1997, Appl. No. 866,145.

Claims priority, application United Kingdom, May 6, 1993, 9309344

Int. Cl.[7] B05B *1/32*

U.S. Cl. 239—455 **14 Claims**



1. A gas burner system for use in a heating apparatus along a heating region, said system comprising an outer tube extending along said region, said outer tube having first and second end portions, a central portion between said end portions, a continuous aperture slot extending along said outer tube providing an outlet for burning gas, a plurality of barriers within said outer tube separating said outer tube into a plurality of separate compartments communicating respectively with separate lengths of the said slot, said plurality of barriers mounted within the outer tube on an elongate supporting member so as to be positionally adjustable longitudinally of the outer tube and feed conduits providing a connection between said compartments and a source of combustible gas wherein the said slot lengths comprise two edge region slot lengths respectively at the said end portions of the outer tube, and one or more central region slot lengths in the said central portion of the outer tube, each said edge region slot length being a minor proportion of the length of the said central portion of the outer tube, and wherein at least one of the said barriers is moveable longitudinally of the outer tube so as to be positionally adjustable thereby to shorten or lengthen the compartments separated thereby

and hence to shorten or lengthen the slot lengths in communication with said compartments.

6,015,102

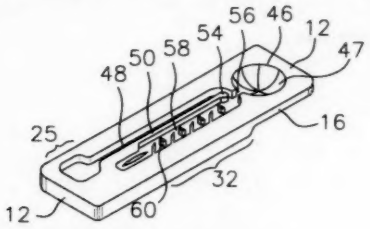
EXTERNAL EMITTER FOR DRIP IRRIGATION HOSE

Harold Daigle, and Mark Huntley, both of San Diego, Calif., assignors to T-Systems International, Inc., San Diego, Calif.

Provisional application No. 60/055,992, Aug. 18, 1997. This application Aug. 18, 1998, Appl. No. 136,354.

Int. Cl.[7] **B05B** *15/00;1/30*

U.S. Cl. 239—542 **26 Claims**



1. A drip irrigation hose comprising:

a tubular body enclosing a water supply passage;

an external emitter attached to the outside of the tubular body, the emitter comprising a front wall, a back wall, side walls and a top wall defining a flow regulating channel, and further comprising an outlet in at least once of the walls; and

an inlet to the emitter, the inlet being in fluid communication with the water supply passage and the flow regulating channel;

a purging bulb having an internal region in fluid communication with the flow regulating channel;

whereby water flows through the water supply passage, through the inlet into the emitter, through the flow regulating channel, and out the outlet, and whereby pressure exerted on the purging bulb generates local pressure to back-flush or eject contaminants in the emitter.

6,015,103

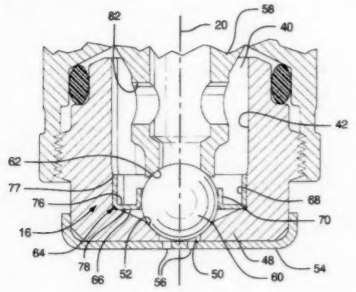
FILTER FOR FUEL INJECTOR

George A. Kotkowicz, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1998, Appl. No. 93,764

Int. Cl.[7] **B05B** *1/30;1/14;* **F02M** *39/00*

U.S. Cl. 239—585.4 **3 Claims**



1. A fuel injector for delivery of fuel to an internal combustion engine comprising an injector body defining a central axis, a fuel discharge opening coaxial with said central axis having a valve seat extending thereabout, a valve element normally seated on said valve seat to close said fuel discharge opening and operable to move off of said valve seat to open said fuel discharge opening allowing fuel to pass therethrough, a filter-valve guide positioned coaxially with said central axis, upstream of said valve seat, comprising an annular closed bottom, an outer wall extending coaxially upwardly from said annular closed bottom, and an inner wall extending coaxially upwardly from said annular closed bottom defining a central opening for passage of said valve element wherein said inner wall guides said valve element as said valve element moves relative to said valve seat, and said annular closed bottom comprising filtration openings to filter particulates from fuel passing therethrough, wherein particulates are prevented from flowing to said valve seat.

6,015,104

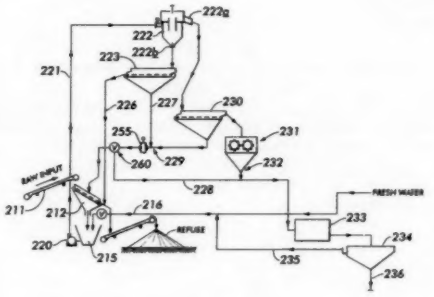
PROCESS AND APPARATUS FOR PREPARING FEEDSTOCK FOR A COAL GASIFICATION PLANT

John W. Rich, Jr., R.D. #1, Box 211, Auburn, Pa. 17922

Provisional application No. 60/079,766, Mar. 20, 1998, Provisional application No. 60/079,434, Mar. 26, 1998. This application Mar. 8, 1999, Appl. No. 264,049.

Int. Cl.[7] **B02C** *23/08*

U.S. Cl. 241—20 **3 Claims**



1. A process for preparing feedstock for a coal gasification plant, comprising the steps of:

admitting a raw feedstock slurry containing carbonaceous and inert particles to a hydrocyclone and therein separating a substantial fraction of the carbonaceous particles in the hydrocyclone to yield a primary carbonaceous-rich overflow;

further separating said primary carbonaceous-rich overflow to produce a secondary carbonaceous-rich overflow and a media bleed slurry;

crushing said secondary carbonaceous-rich overflow;

adding at least a portion of said media bleed slurry to said crushed secondary carbonaceous-rich overflow;

milling said crushed secondary carbonaceous-rich overflow and media bleed slurry portion; and

conditioning said crushed and milled carbonaceous rich material to provide a finished feedstock slurry having a predetermined solids to liquid ratio suitable for feeding to a gasifier.

6,015,105

MACHINE AND METHOD FOR REMOVING TREAD MATERIAL FROM USED MOTOR VEHICLE TIRE AND PRODUCING RECYCLABLE BUFFINGS

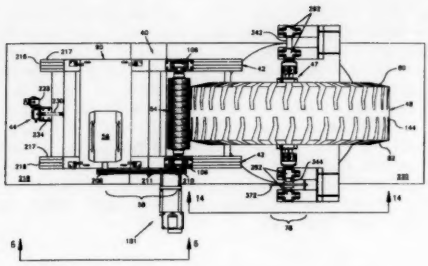
John C. Brewer, Salt Lake City, Utah, assignor to Garb-Oil & Power Corporation, Salt Lake City, Utah

Filed Apr. 24, 1998, Appl. No. 66,084

Int. Cl.[7] **B02C** *19/12*

U.S. Cl. 241—30 **19 Claims**

1. An apparatus for removing remaining tread material from the outer, ground-contacting portion and from the sidewalls of used vehicle tires, comprising:



tire holding means positioned on supporting structure for receiving and holding a vehicle tire and being powered so as to rotate the tire; and

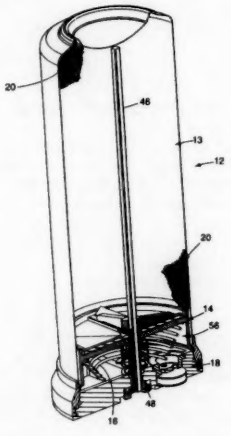
tire-operative means positioned on mounting structure therefor, said supporting structure and said mounting structure being operationally positionable relative to each other such that said tire-operative means can contact and remove tread material from the outer, ground-contacting portion as well as from the sidewalls of a tire held by said tire holding means.

6,015,106

APPARATUS FOR CONTROLLABLY BREAKING HOLLOW SPHERES

Thomas A. Turgeon, Fridley; David J. Colburn, South St. Paul, and Christopher R. Yungers, St. Paul, all of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Sep. 1, 1998, Appl. No. 145,000
Int. Cl.[7] B02C *19/12*
U.S. Cl. 241—69 **15 Claims**



1. An apparatus for controllably breaking hollow spheres comprising:

a) an enclosure;

b) a first screen within or at one end of the enclosure having holes that are approximately no larger in mesh size than the smallest hollow spheres;

c) a screen support providing sufficient support to the first screen to allow it to hold the hollow spheres while they are being broken and having void areas to allow debris from broken spheres to pass through;

d) an impeller in close proximity to the first screen having a shape which causes the hollow spheres that are on the first screen to break as the impeller moves across the first screen; and

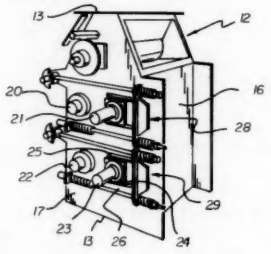
e) a support screen disposed between the first screen and the screen support and having a mesh size larger than the first screen and sufficient to allow debris from broken spheres to pass through the support screen and constructed so that dimpling of the first screen when the impeller moves across the first screen to break the hollow spheres is substantially reduced or prevented.

6,015,107

ROLLER ALIGNMENT SYSTEM

Bill Stegmeier, 27116 Grummand Ave., Tea, S. Dak. 57064

Filed Dec. 3, 1998, Appl. No. 204,492
Int. Cl.[7] B02C *4/42*
U.S. Cl. 241—101.2 **5 Claims**



1. A roller grinder, comprising:

a housing having a top, a bottom, a front, a back, and first and second sides;

a pair of rollers disposed in said housing, wherein said pair of rollers comprises:

front and back rollers, each of said rollers being generally cylindrical and having a pair of opposite ends, said front roller being positioned towards said front of said housing, said back roller being positioned towards said back of said housing;

each of said ends of said front roller being rotationally mounted to an associated side of said housing;

each of said ends of said back roller being rotationally mounted to an associated side of said housing, each of said ends of said back roller being slidably mounted to the associated side of said housing to permit sliding of said roller between said front and back of said housing;

an adjustment assembly for adjusting the spacing between said pair of rollers, wherein said roller adjustment assembly comprises a first side subassembly, a second side subassembly, and an elongate linking rod;

said first side subassembly comprising:

a first adjustment bracket having upper and lower ends, said first adjustment bracket abutting said first end of said back roller, said first adjustment bracket being pivotally coupled to said first side of said housing at a point between said ends of said first adjustment bracket;

threaded elongate upper and lower first adjustment rods each having front and back ends;

said back end of said upper first adjustment rod being extended through said upper end of said first adjustment bracket, said front end of said upper first adjustment rod being positioned adjacent said front of said housing;

said first side of said housing having a holding tab, said holding tab being positioned towards said front of said housing;

said back end of said lower first adjustment rod being extended through said lower end of said first adjustment bracket, said lower first adjustment rod being extended through said holding tab of said first side of said housing, said front end of said lower first adjustment rod being outwardly extended from said front of said housing;

a first adjustment nut being threaded on said front end of said lower first adjustment rod; and

a first coarse adjustment member being coupled to said front end of said upper first adjustment rod, said first coarse adjustment member being pivotally mounted on said first side of said housing;

said second side subassembly comprising:

a second adjustment bracket having upper and lower ends, said second adjustment bracket abutting said second end of said back roller, said second adjustment bracket being pivotally coupled to said second side of said housing at a point between said ends of said second adjustment bracket;

threaded elongate upper and lower second adjustment rods each having front and back ends;

said back end of said upper second adjustment rod being extended through said upper end of said second adjustment bracket, said front end of said upper second adjustment rod being positioned adjacent said front of said housing;

said second side of said housing having a holding tab, said holding tab of said second side being positioned towards said front of said housing;

said back end of said lower second adjustment rod being extended through said lower end of said second adjustment bracket, said lower second adjustment rod being extended through said holding tab of said second side of said housing, said front end of said lower second adjustment rod being outwardly extended from said front of said housing;

a second adjustment nut being threaded on said front end of said lower second adjustment rod; and

a second coarse adjustment member being coupled to said front end of said upper second adjustment rod, said second coarse adjustment member being pivotally mounted on said second side of said housing; and

said linking rod connecting said first coarse adjustment member to said second coarse adjustment member, said linking rod being located adjacent said front of said housing.

6,015,108

CRUSHER

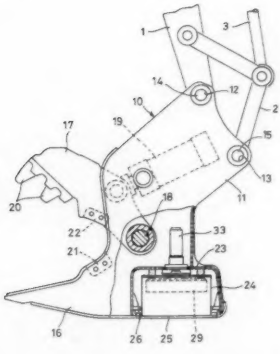
Takashi Okumura; Hiroshi Okada, and Yoshifumi Itoh, all of Nabari, Japan, assignors to Nippon Pneumatic Manufacturing Co., Ltd., Osaka, Japan

Filed May 14, 1998, Appl. No. 78,664

Claims priority, application Japan, Dec. 3, 1996, 8-322966

Int. Cl.[7] B02C *1/10*

U.S. Cl. 241—101.73 **11 Claims**



1. A crusher comprising a frame having a pair of side plates, a fixed jaw fixed to said frame, a movable jaw pivotally supported on said frame at a position opposite said fixed jaw, a first hydraulic cylinder for opening and closing said movable jaw relative to said fixed jaw, a magnet case mounted between said pair of side plates of said frame, a permanent magnet assembly slidably mounted in said magnet case, and a second hydraulic cylinder connected to said permanent magnet assembly for sliding said permanent magnet assembly in said magnet case,

wherein said first and second hydraulic cylinders are operatively associated with each other,

wherein said permanent magnet assembly comprises:

an open-bottomed box-shaped yoke formed of a magnetizable material;

a permanent magnet mounted in said yoke; and

a coupling member provided on an upper outer surface of said yoke, said coupling member being coupled to a piston rod of said second hydraulic cylinder.

6,015,109

THREAD FEED DEVICE

Per Ohlson, Tvaerred, and Kurt Arne Gunnar Jacobsson, Ulricehamn, both of Sweden, assignors to Memminger-IRO GmbH, Dornstetten, Germany

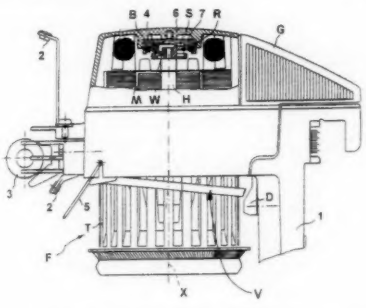
PCT No. PCT/EP96/04409, § 371 Date Jun. 29, 1998, § 102(e) Date Jun. 29, 1998, PCT Pub. No. WO97/14836, PCT Pub. Date Apr. 24, 1997

PCT Filed Oct. 10, 1996, Appl. No. 51,066

Claims priority, application Germany, Oct. 16, 1995, 195 38 449

Int. Cl.[7] B65H *51/00*

U.S. Cl. 242—364.7 **17 Claims**



1. In a yarn feeder for knitting machines having a stationary housing, a storing surface for yarn, a motor and a rotational element which can be driven in a predetermined rotational direction by said motor which said motor can be switched off and switched on, said rotational element being rotatably supported by said housing and serving to wind yarn into a yarn store comprising a plurality of windings on said storing surface from which said yarn can be withdrawn for consumption overhead, said yarn feeder further having a sensor device for detecting movements of a boundary of said yarn store in a withdrawal direction and for generating signals to switch on or switch off the motor, and having a mechanical backturn-detent-mechanism which hinders a backturn movement of said rotational element, said backturn-detent-mechanism comprising a counter member, a braking surface, a first abutment and a detent member which is movable in relation to said counter member between a running position defined by said first abutment and a blocking position, said detent member engaging said braking surface when in said blocking position to prevent said backturn movement of said rotational element, said detent member being movable with a rotational movement of said rotational element in each direction of rotation by a drag power generated by friction contact between said detent member and a drag surface, said drag power displacing said detent member relative to said counter member independently of said direction of rotation either into said running position or into said blocking position, comprising the improvement wherein said counter member and the detent member are ring bodies which are set one within the other and are rotatable relative to each other about a rotational axis of said rotational element, said ring bodies having mutual areas of engagement therebetween which are defined by at least a section of a

circle wherein said areas of engagement are disposed eccentrically relative to said rotational axis of said rotational element, said detent member including a peripheral surface which includes a counter-braking surface range which has a limited extent in a circumferential direction and cooperates with said braking surface when said detent member is in said blocking position to prevent the backturn movement of said rotational element.

6,015,110

WIRE RECEIVING DEVICE

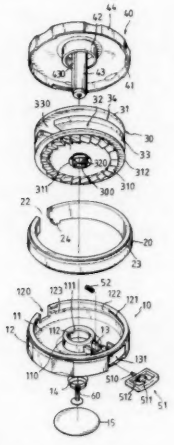
Cheng-Ting Lai, No. 17, Alley 28, Lane 303, Mei Tsuen Taicheng, Taiwan

Filed Jan. 15, 1999, Appl. No. 231,647

Claims priority, application Taiwan, Jul. 10, 1998, 85219503A02

Int. Cl.[7] **B65H** *75/40*

U.S. Cl. 242—388.1 **8 Claims**



1. A wire receiving device comprising:

a base member (**10**) having a first peripheral wall (**12**) extending therefrom and a groove (**122**) defined in the inner side of said first peripheral wall (**12**) by an upper flange (**121**) and a lower flange, a wire entrance (**120**) and an aperture (**131**) respectively defined through said first peripheral wall (**12**), a central tube (**110**) extending from the bottom of said base member (**10**) and a passage (**112**) defined through said central tube (**110**), an engaging flange (**111**) extending radially outward from the top of said central tube (**110**);

a C-shaped member (**20**) having an upper annular recess (**23**) and a lower annular recess (**231**) defined in the outside thereof so that said upper flange (**121**) of said base member (**10**) is movably received in said lower annular recess (**231**);

a wire receiving member (**30**) having a hollow shaft (**300**) which has a lip (**311**) extending from the lower end thereof so as to be engaged with said engaging flange (**111**) of said central tube (**110**), an upper plate (**31**), a mediated plate (**33**) and a lower plate (**312**) respectively extending radially outward from said hollow shaft (**300**), said lower plate (**312**) having an annular teeth (**310**) defined in the bottom thereof and said mediated plate (**33**) having a notch (**330**) defined therein, said wire receiving member (**30**) rotatably received in said C-shaped member (**20**) and said base member (**10**);

a cap (**40**) having a second peripheral wall (**44**) extending from the periphery thereof and a rod (**43**) extending centrally from the bottom of said cap (**40**), said rod (**43**) securely inserted into said hollow shaft (**300**) so that when rotating said cap (**40**), said wire receiving member (**30**) is co-rotated, said second peripheral wall (**44**) having a flange (**41**) extending from the lower edge of said second peripheral wall (**44**) so as to be received in said upper annular recess (**23**) of said C-shaped member (**20**);

a bolt (**60**) threadedly engaged into said rod (**43**) and a spring (**16**) being biasedly mounted between said rod (**43**) and the head of said bolt (**60**), and

a control member (**51**) movably received in said aperture (**131**) and having a pawl member (**512**) connected to the top thereof, said pawl member (**512**) engaged with said annular teeth (**310**) when said control member (**51**) is not pushed.

6,015,111

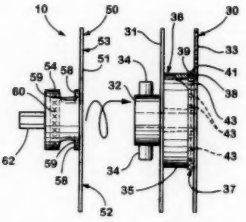
FISHING LINE EXCHANGER, STRUCTURE AND METHOD

Joseph J. Berke, 3248 Interlaken, West Bloomfield, Mich. 48323

Filed Apr. 24, 1998, Appl. No. 65,699

Int. Cl.[7] **A01K** *89/017;* **B65H** *75/14;75/22;75/30*

U.S. Cl. 242—394 **18 Claims**



1. An apparatus for exchanging a fishing line of a fishing reel, said apparatus comprising:

a) a spool having a first flange, a second flange and a central cylinder located between said first and said second flanges for receiving a fishing line; and

b) wherein said spool further includes a means for driving said fishing reel.

6,015,112

ARRANGEMENT FOR LEADING FLEXIBLE ELEMENTS TO A ROCK DRILL, AND A HOSE REEL STRUCTURE

Leo Häkkinen, Tampere, and Timo Laitinen, Viiala, both of Finland, assignors to Tamrock OY, Finland

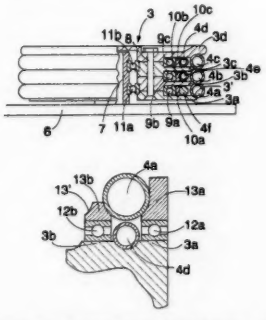
PCT No. PCT/FI97/00018, § 371 Date Jul. 20, 1998, § 102(e) Date Jul. 20, 1998, PCT Pub. No. WO97/26435, PCT Pub. Date Jul. 24, 1997

PCT Filed Jan. 14, 1997, Appl. No. 101,641

Claims priority, application Finland, Jan. 15, 1996, 960187

Int. Cl.[7] **B65H** *27/00;75/18;57/14*

U.S. Cl. 242—397.5 **9 Claims**



1. Arrangement for leading flexible elements, such as hoses, around a hose reel to a rock drill moving along a feed beam, in

which arrangement the flexible elements are coupled at least at one point in their longitudinal direction immovably relative to the feed beam, led to travel towards the rear end of the feed beam, around a hose reel that revolves round a shaft essentially perpendicular relative to the feed beam and moves at one half the rate of the rock drill relative to the feed beam behind the rock drill in the same direction with respect to the rate of the rock drill, and further coupled to the rock drill or a carriage thereof, characterized in that the flexible elements are mounted around the same hose reel in at least two successive layers in the radial direction of the hose reel and the hose reel is structured such that each radial layer is pivoted so as to revolve round the shaft of the hose reel independently of other layers.

6,015,113

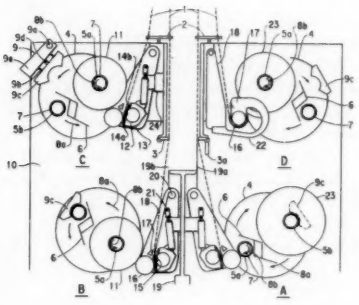
WINDER FOR SYNTHETIC FILAMENTS

Thomas Patrick Daly, Aston, Pa.; Joseph Edward Koskol, Newark, Del.; Kevin Robert Madigan, Charlottesville, Va.; Jun Takagi, and Naofumi Yamauchi, both of Shiga, Japan, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application No. 08/944,217, Oct. 6, 1997, abandoned. This application Oct. 5, 1998, Appl. No. 166,389.

Int. Cl.[7] **B65H** *67/044;54/02;57/00*

U.S. Cl. 242—474.5 **18 Claims**



1. A winder for winding synthetic continuous elastomeric filaments, comprising:

(a) a frame having a front face;

(b) a support mounted on the face and perpendicular to the face;

(c) a driven turret having an axis and being rotatably mounted on the face;

(d) a first driven spindle assembly having an axis and a second driven spindle assembly, the spindle assemblies being rotatably mounted on the turret on opposite sides of the turret axis and being capable of having tubecores mounted thereon;

(e) a freely rotatable contact roll having an axis and being mounted substantially parallel to the first and second spindle assemblies and below a horizontal plane in which the turret axis lies; and

(f) a traverse assembly comprising a traverse cam mounted axially parallel and adjacent to the contact roll so that filament passing the traverse assembly is capable of traversing back and forth along the contact roll, the traverse assembly and contact roll being mounted on a pendulous swing arm pivotably mounted on the support and capable of pivoting through at least 7°;

wherein the turret, first and second spindle assemblies, swing arm, traverse assembly, and contact roll are mounted in order that

(i) rotation of the turret to a first indexed winding position is capable of urging a tubecore mounted on the first spindle assembly against the contact roll for partial winding of a package;

(ii) during rapid rotation of the turret to and between 1–4 subsequent indexed winding positions, the partially wound package on the first spindle assembly can remain in contact with the contact roll;

(iii) rotation of the turret to a final position is capable of presenting the package on the first spindle assembly for doffing and is capable of urging a tubecore on the second spindle assembly against the contact roll for first position winding;

(iv) a filament wrap angle around the contact roll of about 180°–225°; and

(v) at least about 99% of the winding occurs at the indexed positions.

6,015,114

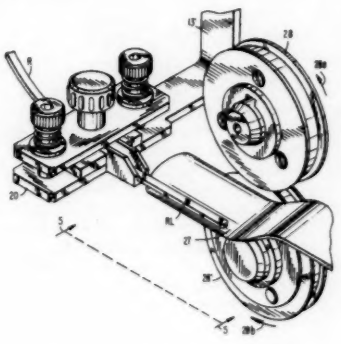
METHOD AND APPARATUS FOR EXPEDITIOUSLY PROVIDING A REEL OF INSULATION MATERIAL TO AN INSULATING MACHINE

Antonio Randazzo, Venice, and Rossano Galassi, Florence, both of Italy, assignors to Axis USA, Inc., Tampa, Fla.

Provisional application No. 60/042,908, Mar. 27, 1997. This application Dec. 24, 1997, Appl. No. 998,045.

Int. Cl.[7] **B65H** *19/00;26/06*

U.S. Cl. 242—559.2 **10 Claims**



1. Apparatus for providing insulating material in elongated strip form to a nip between a pair of feed rollers that are respectively rotatable about a pair of parallel feed roller rotation axes comprising:

reel holding structure configured to hold a plurality of reels of the strip-form insulating material with a leading end portion of the strip from each reel extending in a cantilevered condition from the reel holding structure;

second structure configured to selectively move the reel holding structure relative to the feed rollers so that the cantilevered end portion of any the strip from reel can be made to move sideways relative to the feed rollers and thereby be made to approach the nip between the feed rollers along an axis which is substantially parallel to the feed roller rotation axes; and

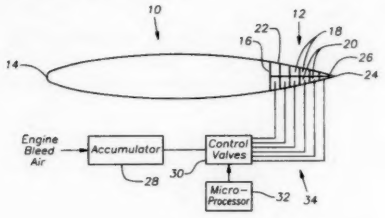
a guide surface which is stationary relative to the nip between the feed rollers and which is configured to guide into the nip the cantilevered end portion of the strip from any reel that is approaching the nip as a result of operation of the second structure.

6,015,115

INFLATABLE STRUCTURES TO CONTROL AIRCRAFT

Kenneth Merle Dorsett, Arlington, and Christopher Sean Stewart, Fort Worth, both of Tex., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Mar. 25, 1998, Appl. No. 47,695
Int. Cl.[7] B64C *3/44*
U.S. Cl. 244—123 **16 Claims**



1. An airfoil for an aircraft, said airfoil having a leading edge and a trailing edge and comprising:

a rigid structural member adapted to be stationarily mounted to the aircraft, said structural member having a leading side and a trailing side;

at least one inflatable section located on one of said leading and trailing sides of said structural member and having a plurality of bladders mounted to said member;

an elastic skin covering said member and said plurality of bladders in the inflatable section to define one of said leading and trailing edges;

a control system for selectively inflating and deflating said bladders in said inflatable section independently from one another for modifying the shape of said elastic skin to cause desired flight characteristics; and

wherein said plurality of bladders comprises at least one selectively inflatable upper bladder and at least one selectively inflatable lower bladder for controlling a deflection of said elastic skin, said inflatable section further comprising a movable structure member having a first end and a second end, said first end being attached to one of said leading and trailing edges of said airfoil, said second end being attached to said rigid structural member, said movable structure comprising a plurality of rigid sections connected together by joints to allow articulated movement of said movable structure member between said first and second ends to decrease the effective distance between said first and second end, thus changing an effective chord length of said airfoil.

6,015,116

FUEL EFFICIENT METHODS FOR SATELLITE STATIONKEEPING AND MOMENTUM DUMPING

Bernard M. Anzel, El Segundo; Yiu-Hung M. Ho, Palos Verdes Estates, and Richard A. Noyola, Torrance, all of Calif., assignors to Hughes Electronics Corporation, El Segundo, Calif.

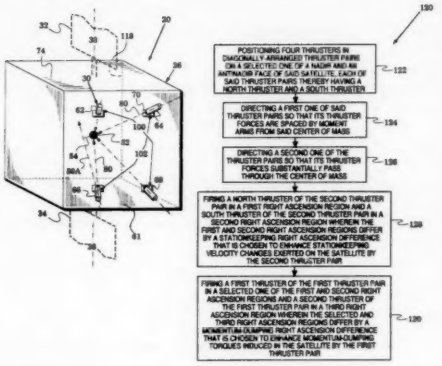
Filed Dec. 11, 1997, Appl. No. 989,184
Int. Cl.[7] B64G *1/26*
U.S. Cl. 244—169 **28 Claims**

1. A method of stationkeeping and momentum dumping for an earth satellite wherein the satellite has a center of mass, the method comprising the steps of:

positioning four thrusters in diagonally-arranged thruster pairs on a selected one of a nadir and an antinadir face of the satellite, each of the thruster pairs thereby having a north thruster and a south thruster;

directing a first one of said thruster pairs so that its thruster forces are spaced by moment arms from said center of mass;

directing a second one of said thruster pairs so that its thruster forces substantially pass through said center of mass;


POSITIONING FOUR THRUSTERS IN DIAGONALLY ARRANGED THRUSTER PAIRS ON A SELECTED ONE OF A NADIR AND AN ANTINADIR FACE OF SAID SATELLITE, EACH OF SAID THRUSTER PAIRS THEREBY HAVING A NORTH THRUSTER AND A SOUTH THRUSTER
DIRECTING A FIRST ONE OF SAID THRUSTER PAIRS SO THAT ITS THRUSTER FORCES ARE SPACED BY MOMENT ARMS FROM SAID CENTER OF MASS
DIRECTING A SECOND ONE OF THE THRUSTER PAIRS SO THAT ITS THRUSTER FORCES SUBSTANTIALLY PASS THROUGH THE CENTER OF MASS
FIRING A NORTH THRUSTER OF THE SECOND THRUSTER PAIR IN A FIRST RIGHT ASCENSION REGION AND A SOUTH THRUSTER OF THE SECOND THRUSTER PAIR IN A SECOND RIGHT ASCENSION REGION WHEREIN THE FIRST AND SECOND RIGHT ASCENSION REGIONS DIFFER BY A STATIONKEEPING RIGHT ASCENSION DIFFERENCE THAT IS CHOSEN TO ENHANCE STATIONKEEPING VELOCITY CHANGES EXERTED ON THE SATELLITE BY THE SECOND THRUSTER PAIR
FIRING A FIRST THRUSTER OF THE FIRST THRUSTER PAIR IN A SELECTED ONE OF THE FIRST AND SECOND RIGHT ASCENSION REGIONS AND A SECOND THRUSTER OF THE FIRST THRUSTER PAIR IN A THIRD RIGHT ASCENSION REGION WHEREIN THE SELECTED AND THIRD RIGHT ASCENSION REGIONS DIFFER BY A MOMENTUM-DUMPING RIGHT ASCENSION DIFFERENCE THAT IS CHOSEN TO ENHANCE MOMENTUM-DUMPING TORQUES INDUCED IN THE SATELLITE BY THE FIRST THRUSTER PAIR
120
122
124
126
128
130

firing each of said first thruster pair to generate momentum-dumping torques in said satellite; and

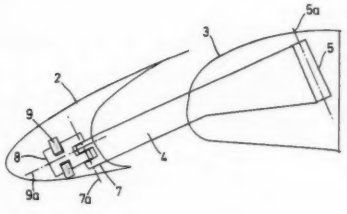
firing each of said second thruster pair to generate stationkeeping velocity changes in said satellite.

6,015,117

VARIABLE CAMBER WING MECHANISM

Michael C Broadbent, 1 Johnson Close, Marston Moretaine Beds, United Kingdom, MK43 OJT

PCT No. PCT/GB97/00979, § 371 Date Dec. 2, 1997, § 102(e) Date Dec. 2, 1997, PCT Pub. No. WO97/38900, PCT Pub. Date Oct. 23, 1997
PCT Filed Apr. 9, 1997, Appl. No. 973,260
Claims priority, application United Kingdom, Apr. 13, 1996, 9607707; Oct. 11, 1996, 9621194
Int. Cl.[7] B64C *3/50*
U.S. Cl. 244—214 **12 Claims**



1. A variable camber wing mechanism, comprising:

a main wing section having a leading edge;

a slat member connected by at least two swing arm members to said main wing section, each of said swing arm members being pivotally connected to said main wing section at a first end thereof and connected to said slat member at a second end thereof, and passing through a slot in the leading edge of said main wing section and arranged for pivotal movement along the length of the slot; and,

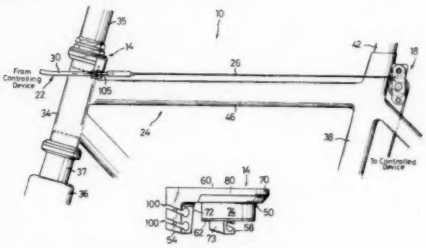
a shutter member for sealing the slot around each of said swing arm members for preventing ingress of ice and water into said main wing section, said shutter member being connected to said swing arm members and arranged for sliding movement with said swing arm members along the slot and thereby parallel to the leading edge.

6,015,118

CONTROL CABLE GUIDE FOR A BICYCLE

Hiromi Oda, Wakayama, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Jun. 23, 1997, Appl. No. 881,895
Int. Cl.[7] B62H *1/00*
U.S. Cl. 248—65 **38 Claims**



1. A cable guide for a bicycle comprising:

an annular monomerous mounting member having a substantially flat upper surface and a substantially flat lower surface, wherein the mounting member includes a circular mounting opening, and wherein the mounting opening has a diametrical axis that is parallel to a mounting plane;

wherein the mounting member includes:

a first mounting section defining a first mounting section opening forming a first portion of the mounting opening and having a first mounting section opening diameter;

wherein the first mounting section includes a first mounting section outer peripheral surface;

a second mounting section defining a second mounting section opening forming a second portion of the mounting opening and having a second mounting section opening diameter;

wherein the second mounting section includes a second mounting section outer peripheral surface;

wherein the first mounting section outer peripheral surface is disposed radially outwardly relative to the second mounting section outer peripheral surface;

a cable support member coupled to the mounting member between the upper surface and the lower surface and having a cable passage including a cable entry opening and a cable exit opening, wherein the cable passage has a straight longitudinal axis passing through the cable entry opening and the cable exit opening, and wherein the longitudinal axis is inclined less than approximately 45° relative to the mounting plane;

wherein a diameter of the mounting opening along its entire length in a direction perpendicular to the mounting plane is greater than a diameter of the cable passage along its entire length in a direction of the longitudinal axis;

wherein the cable support member has an outer peripheral surface facing and spaced apart from the second mounting section outer peripheral surface.

6,015,119

COMBINATION HOLDING AND STABILIZING DEVICE

Jovanka Starchevich, 138 Sullivan St., New York, N.Y. 10012

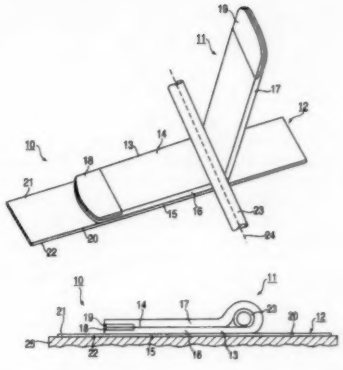
Provisional application No. 60/105,860, Oct. 27, 1998. This application Nov. 20, 1998, Appl. No. 197,048.
Int. Cl.[7] F16L *3/08*
U.S. Cl. 248—65 **16 Claims**

1. A combination holding and stabilizing device for securely retaining a tubular object at a fixed location comprising:

a securing unit comprises an elongated longitudinal body having a top surface, a bottom surface and first and second opposite ends, said top surface having adhesive for retaining said tubular object, said body having first and second lateral portions foldable about a fold line to overlie in superposed relation with said corresponding adhesive surfaces facing each other in abutting relation, latching means on said top surface at said first and second ends for holding the respective ends in tight relationship when said second portion foldably overlaps said first portion whereby said tubular object placed along said fold line is securely positioned in response to said first and second portions being in superposed position;

an anchoring unit for retaining said device at said fixed location; and

means for attaching said securing unit onto said anchoring unit.

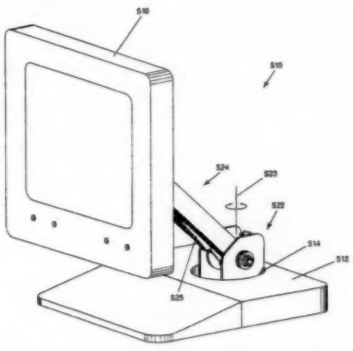


6,015,120

DESKTOP FLAT PANEL DISPLAY SUPPORT SYSTEM

Harry C. Sweere, Minneapolis; Michael D. Gonnerman, and Donald M. Voeller, both of Eagan, all of Minn., assignors to Ergotron, Inc., St. Paul, Minn.

Division of application No. 08/660,397, Jun. 7, 1996, Pat. No. 5,842,672. This application Feb. 12, 1998, Appl. No. 23,226. This patent is subject to a terminal disclaimer.
Int. Cl.[7] A47F *7/00*
U.S. Cl. 248—123.11 **7 Claims**



1. A desktop flat panel display support system suitable for supporting a flat panel display above a desktop, the system comprising:

a. an arm having a first end and a second end and a spring attachment situated between the first end and the second end;

b. a pivot means including at least one UHMWPE washer at each of the ends of said arm;

c. a flat panel display attachment means attached at said pivot means of said first end of said arm;

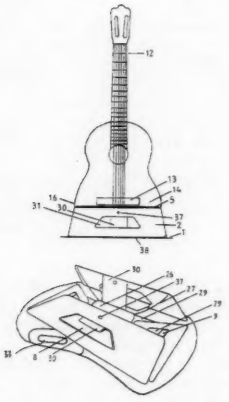
d. a bracket means attached at said pivot means of said second end of said arm and wherein said bracket means includes an adjustable spring mount; and,

e. a spring connecting the adjustable spring mount and the spring attachment and providing a counterbalance force to the flat panel display attachment means.

6,015,121
COLLAPSIBLE STAND

Martin Shaun Reid, 56 Cranbourne Avenue, Wanstead, London E11 2BQ, United Kingdom

PCT No. PCT/GB96/02867, § 371 Date Jun. 9, 1998, § 102(e) Date Jun. 9, 1998, PCT Pub. No. WO97/19443, PCT Pub. Date May 29, 1997
PCT Filed Nov. 21, 1996, Appl. No. 65,034
Claims priority, application United Kingdom, Nov. 22, 1995, 9523913; Aug. 19, 1996, 9617401
Int. Cl.[7] A47G *23/02*
U.S. Cl. 248—150 **42 Claims**



1. A stand for supporting an item in an upright manner, comprising:

a base portion;

a plurality of side portions hinged to the base portion so that said plurality of side portions can be folded to be substantially flat with the base or oriented at an angle to the base for supporting said item;

biasing means adapted to be responsive to said item being inserted in the stand to bias each side portion into adapted to be in contact with said item for support in the stand; and

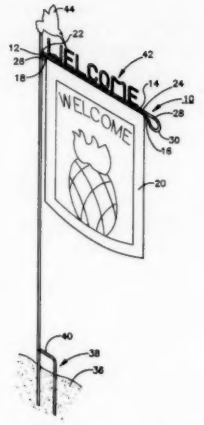
means for supporting each said side portion at an angle to the base against a bias force direction;

wherein each said side portion supporting means is releasable for folding the stand.

6,015,122
FLAG HOLDER

Fei Qui, 3716 Barrington Bridge Pl., Richmond, Va. 23233

Filed May 15, 1998, Appl. No. 79,811
Int. Cl.[7] A45F *3/44*
U.S. Cl. 248—156 **10 Claims**

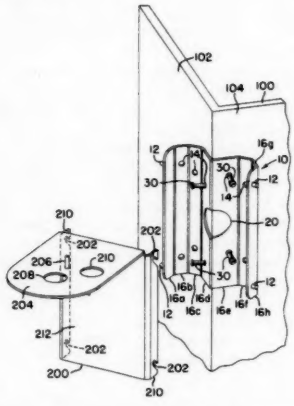


1. A flag holder including a vertical base, a horizontal rod extending sideways from the vertical base and having a support end proximate the vertical base and an outer end, a flag support rod extending sideways from the base parallel to, below and separated from the horizontal rod and having a support end proximate the base and an outer end, the flag support rod or the horizontal rod including a bend which defines a tortuous path between the outer ends of the horizontal rod and the flag support rod to prevent a flag from being accidentally removed from the flag support rod, and including a space between said outer ends of said horizontal rod and said flag support rod to permit the insertion of a flag.

6,015,123
MOUNTING BRACKET FOR A CAMERA BASE

Sergio M. Perez, Boynton Beach, and Walter N. Yap, Boca Raton, both of Fla., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Filed Mar. 3, 1998, Appl. No. 33,436
Int. Cl.[7] A47B *96/06;* **A47G** *29/00;* **F16M** *11/00;* **A47F** *5/00*
U.S. Cl. 248—220.1 **15 Claims**



1. A mounting bracket for mounting of a camera base, said mounting bracket comprising:

first means for defining a concave right-angled structure for selectively being fitted to an outside wall corner, said first means comprising first and second outside corner panel sections angled at 90° to each other;

second means for defining a substantially planar structure for selectively being fitted to a planar wall section, said second means comprising first and second planar panel sections connected to said first and second outside corner panel sections, respectively, and arranged in a common plane;

third means for defining a convex right-angled structure for selectively being fitted to an inside wall corner, said third means comprising first and second inside corner panel sections connected to said first and second planar panel sections, respectively, and angled at 90° to each other; and

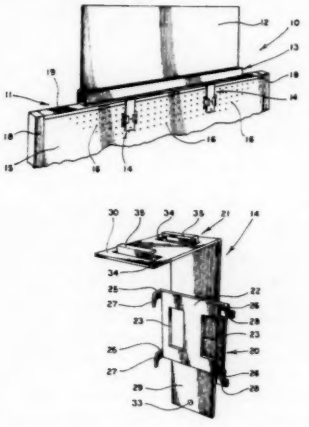
fourth means for engaging the camera base, said fourth means comprising first and second attachment panel sections for permitting attachment of the camera base and connected to said first and second inside corner panel sections, respectively, and arranged substantially parallel to each other.

6,015,124

BRACKET ASSEMBLY FOR CARRYING SIGNAGE FOR A RETAIL DISPLAY FIXTURE

Kenneth Loy, Alliance, Ohio, assignor to Darko Company, Inc., Twinsburg, Ohio

Filed Sep. 18, 1997, Appl. No. 932,856
Int. Cl.[7] A47B *96/06*
U.S. Cl. 248—220.31 **27 Claims**



1. A bracket assembly to attach a sign to a display fixture comprising a first bracket portion attachable to the fixture, and a second bracket portion slidable relative to said first bracket portion and adapted to carry the sign, such that the sliding of said second bracket portion relative to said first bracket portion positions the sign at a predetermined height relative to the fixture.

6,015,125

TOILET PAPER HOLDER WITH WALL MOUNT

Larry D. Fischer, 22609 28th Ave. S., Des Moines, Wash. 98198

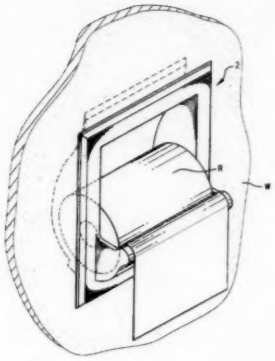
Continuation-in-part of application No. 08/821,866, Mar. 21, 1997, abandoned. This application Sep. 16, 1998, Appl. No. 154,548.
Int. Cl.[7] G12B *9/00;* **B65H** *16/02*
U.S. Cl. 248—231.9 **4 Claims**

1. A spindle-free toilet roll holder for attachment, without need for fasteners, into a wall having a specified thickness, the holder comprising:

(a) a back wall in the shape of a half-ovoid with a wider portion of the half-ovoid at a base portion of the back wall;

(b) a front wall lacking any opening therein, the front wall of lower height than the back wall, the front wall formed by forwardly and upwardly extending the base portion of the back wall to terminate in a rounded upper lip;

(c) a pair of side walls, the side walls, back wall and front wall forming a cavity in a base portion of the toilet paper holder, the cavity having a cross-section substantially in the shape of a bottom portion of a hen's egg and sized for holding a roll of toilet paper, the cavity lacking a spindle for insertion into an axial cavity of a roll of toilet paper, the cavity accessible over the upper lip of the front wall for insertion into the holder of a roll of paper;



(d) means for mounting the toilet paper holder to a wall, the mounting means comprising:

(i) an integral vertical frame surrounding the toilet paper holder and extending beyond an outside surface of the base portion, and beyond an outside surface of the upper extremity of the back wall;

(ii) an upper clip wall extending laterally across the upper outside surface of the back wall, and angled toward an adjacent rear of the frame such that a slot approximating the thickness of the wall to which the holder is to be mounted is formed between the clip wall and the frame; and

(iii) a lower clip wall extending laterally across the outside surface of the base portion, the lower outer clip wall angled toward an adjacent rear of the frame to form a slot therebetween sized to hold a thickness of a wall to which the paper holder is to be mounted;

whereby, the paper holder is mounted to an appropriately sized cavity in a dry wall by holding said holder at an angle from the vertical and inserting an upper edge of the dry wall into the space between the frame and the upper clip wall, rotating the holder to a vertical position, such that rear surfaces of the frame contact the wall, and urging the holder downward such that a lower edge of the dry wall is engaged between the frame and the lower clip wall.

6,015,126

TRIANGULAR SNAP-IN MOUNT

Jay A. Murdock, Southgate, Mich., assignor to Lear Automotive Dearborn, Inc., Southfield, Mich.

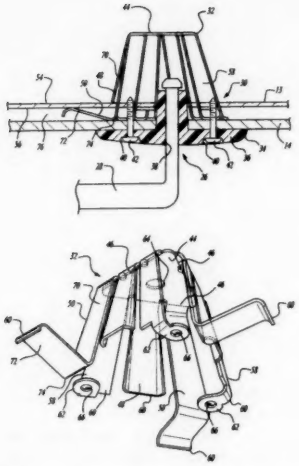
Filed Jun. 1, 1998, Appl. No. 88,608
Int. Cl.[7] A47F *5/00*
U.S. Cl. 248—289.11 **20 Claims**

1. A mount for securing a component to a mounting surface, said mount comprising:

a polygonal base having a plurality of sides;

a resilient first leg extending outwardly from each of said sides of said base; and

a resilient second leg extending outwardly from each of said sides of said base with said first leg being spaced apart from said second leg, said second leg including a first portion connected to a second portion at an elbow, said first portion extending outwardly and downwardly from said base to said elbow, and said second portion extending upwardly and outwardly from said elbow so that said second leg is capable of



engaging the mounting surface and a surface of the component simultaneously.

6,015,127

APPARATUS FOR SUSPENDING AND STORING ARTICLES

Jackson M. Carr, 1730 Jefferson St., Napa, Calif. 94559

Filed Apr. 8, 1998, Appl. No. 57,388

Int. Cl.[7] A47F *5/08;* **B42F** *13/00*

U.S. Cl. 248—339 **6 Claims**

1. An apparatus for suspending and storing articles from an overhead support, said apparatus comprising:

a belay member having a vertical axis, said belay member including a top portion having a center and a base, a first rope aperture disposed proximate said center of said top portion, and a second rope aperture disposed proximate said base of said top portion, said top portion defining a generally triangle-shaped point element including a base having a pair of detents disposed on opposite sides of said second rope aperture.;

a medial portion connected to said top portion, said medial portion defining a first hook-shaped element having an arcuate base and having a third rope aperture; and

a bottom portion connected to said medial portion, said bottom portion defining an arcuate cleat element and a fourth rope aperture, each of said first, second third and fourth rope apertures disposed along said vertical axis.

6,015,128

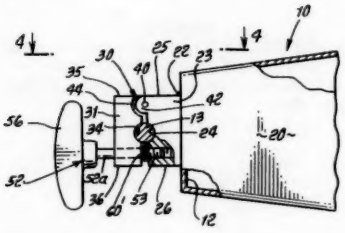
PERCUSSION BELL CLAMPING SUPPORT

Donald G. Lombardi, Thousand Oaks, Calif., assignor to Drum Workshop, Inc., Oxnard, Calif.

Filed Mar. 15, 1999, Appl. No. 268,059

Int. Cl.[7] G10D *13/08*

U.S. Cl. 248—421 **9 Claims**



1. A percussion bell clamping support connected to a percussion bell having a head end and a skirt projecting and flaring away from the head end, comprising:

a) a clamp base adjacent to and supporting the head end, the base having a flat side engaging the percussion bell head end to directly support said head end,

b) a clamp jaw facing the clamp base,

c) adjustable connector structure connecting the jaw to the base for opening and closing the jaw away from and toward the base,

d) and clamping surfaces carried on the jaw and base to be clamped against an upright support member in response to tightening adjustment of said connector structure, said clamping surfaces being concave toward said support member,

e) said connector structure including connectors at least one of which is attached to the base for swinging the jaw toward and away from the base and bell head end, said one connector having a shank passing through the clamp jaw and into the base, toward said head end, said one connector having a handle, said jaw located between and remaining between said handle and said base during said swinging of the jaw and during rotation of the shank by the handle effecting said tightening adjustment.

6,015,129

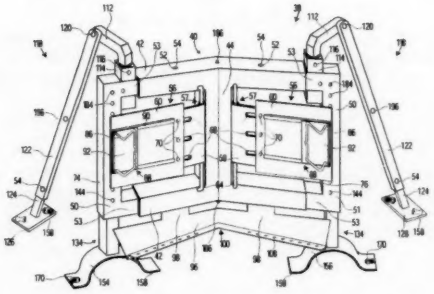
UNIVERSAL READING AND WRITING SURFACE SUPPORT

Christopher L. Harrigan, 3575 W. Dickens, Chicago, Ill. 60647

Filed Jul. 9, 1998, Appl. No. 112,876

Int. Cl.[7] A47B *97/04*

U.S. Cl. 248—444 **25 Claims**



1. An adjustable, portable platform for supporting and holding written materials or the like in a selectable position convenient to a user, the platform comprising:

a central member having an upper transverse section and a lower transverse section joined at their respective centers by a longitudinal section;

a pair of laterally movable frame members, one frame member disposed on each side of the central member and engaging both the upper and lower transverse sections of the central member for lateral motion relative therebetween;

a pair of panels pivotally attached at a proximal end thereof to the platform proximate the central member substantially between the upper and lower transverse sections, each of the panels having retaining means thereon for securely retaining the written materials or the like in a secure position on the panels; and

attachment means located on a distal end of each of the pivotable panels for attachment of the pivotable panels to one of the movable frame members such that the relative angle formed between the pivotable panels can be adjusted to accept the written materials or the like.

6,015,130

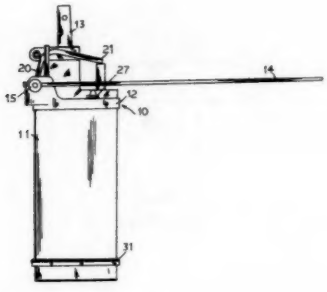
LEAK-PROOF HYDRAULIC DEVICE FOR SUPPORTING A BARBER'S CHAIR

Rudolf Kigel, 50 Ritin Lane, Unit 6, Concord, Ontario, Canada, L4K 4C9

Filed Apr. 20, 1998, Appl. No. 62,687

Int. Cl.[7] F16M *13/00*

U.S. Cl. 248—631 **5 Claims**



1. A hydraulic device adapted for permanent mounting of a barber's chair and operative for raising and lowering the seat of said barber's chair permanently mounted on top of a sliding plunger therein, comprising

a circular cylindrical main housing section adapted for housing operating oil for said device and operative for raising and lowering said sliding plunger, said main housing having a top cover and a circular bottom opening having an inner diameter,

a circular cylindrical lower section adapted to be mounted to said main housing section, said lower section and said main housing having an equal outside diameter, and said lower section having an upper portion provided with a smooth circular surface and a diameter equal to said inner diameter of said circular bottom opening of said main housing section and adapted for insertion engagement with said circular bottom opening of said main housing section to form a snug-fitted circular joint therebetween having an exposed circular joint line,

a metallic sealing compound permanently applied over the entirety of said circular joint line.

6,015,131

COMPOSITE VIBRATION MOUNT

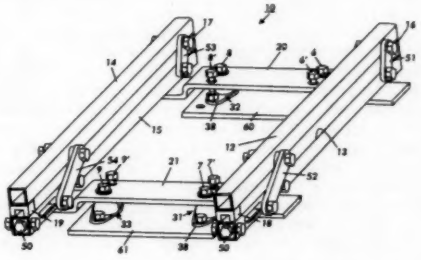
Charles R. Brewer, III, Farmington, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 2, 1998, Appl. No. 53,791

This patent is subject to a terminal disclaimer.

Int. Cl.[7] F16M *1/00*

U.S. Cl. 248—638 **9 Claims**



1. An apparatus for stabilizing a machine against vibration, comprising:

a unitary, composite, vibration mount that includes two planar support members;

at least four vibration isolators with two each of said at least four vibration isolators positioned on and attached to each of said two plate support members;

a pair of frame members with one each thereof positioned on top of said two each of said four vibration isolators;

at least two pair of attachment members connected to said pair of frame members with one member each of said at least two pair of attachment members being movable from a first position atop the other member of each said at least two pair of attachment members to a second position spaced from said other member of each said at least two pair of attachment members;

a linkage mechanism connecting each of said one member of said at least two pair of attachment members to said other member of each said at least two pair of attachment members for relative movement; and

driving bolts connected to said linkage mechanism such that manipulation of said driving bolts clockwise serves to separate the first and second positions said at least two pair or attachment members.

6,015,132

SPEAKER SADDLE

Michael J. Belle, 4410 Chimney Creek Dr., Sarasota, Fla. 34237

Filed Nov. 24, 1997, Appl. No. 977,224

Int. Cl.[7] F16M *3/00*

U.S. Cl. 248—683 **15 Claims**

1. A mounting device for suspending at least one external computer accessory against each opposed upper side surface of the type of housing used for computer monitors and CPU towers for the purpose of reducing desktop clutter of computer operators so as to enhance their work efficiency, the housing selected for use in

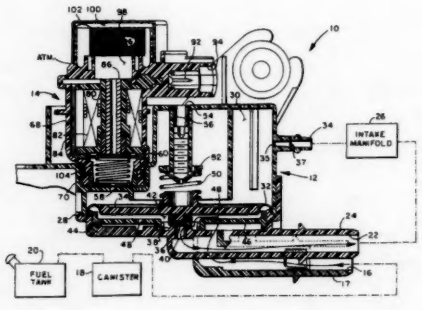
mounting computer accessories having an essentially horizontal top surface and each of the computer accessories selected for mounting having a top, a bottom, and opposing side surfaces which together form a perimeter, said device comprising an elongated, flexible, non-stretchable strap having a first end, a second end, and a lower surface, said strap also being made from material having a textured non-slipping surface, said strap further having a sufficient length dimension adapted to span the top surface of a housing selected for mounting computer accessories, encircle the perimeters of external computer accessories selected for mounting against the housing, and provide a first flap extension on said first end and a second flap extension on said second end, said flap extensions each having a minimum length dimension sufficient for tightly securing at least one of the selected computer accessories within said strap, said strap also having a sufficient width dimension for said strap to adequately support the selected computer accessories in a stable and essentially vertical position against the housing; said device also having two connecting members each configured with a cross bar centrally positioned thereacross to create two openings for insertion therethrough of said strap, each of said openings having a length dimension larger than said width dimension of said strap, said strap being twice inserted through at least one of said openings in each of said connecting members to form a loop into which at least one of the selected computer accessories is placed during mounting, each of said loops having an outside surface, when positioned on said strap during use said connecting members together defining a center portion of said strap having a length dimension adapted to be substantially equivalent to the width dimension of the top surface of the housing; said device further having at least one fastener attached to each of said flap extensions for securing each of said flap extensions to said outside surface of the one of said loops adjacent thereto, and attachment means to securely affix said fasteners to said strap so that when at least one of the selected computer accessories is placed into each of said loops and securely tightened therewithin, and said center portion of said strap is placed upon the top surface of the housing the selected computer accessories become suspended above the desktop surface of a computer operator while remaining in a position readily available to said computer operator for immediate use.

6,015,133

FUEL VAPOR MANAGMENT VALVE

Daniel L. DeLand, Davison, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1999, Appl. No. 300,286
Int. Cl.[7] **F16K** *31/40;* **F02M** *33/02*
U.S. Cl. 251—30.01 **7 Claims**



1.A fuel vapor management valve assembly comprising:

(a) housing structure defining a fluid pressure cavity and including a pressure responsive member operative on one side thereof to define a fluid pressure signal chamber in said cavity and on a side opposite said one side to define a flow regulating pressure chamber in said cavity;

(b) said housing structure including a signal port communicating with said fluid pressure signal chamber and a fuel vapor inlet port and vapor outlet port communicating with said flow regulating pressure chamber, wherein said pressure responsive member is moveable in response to a pressure difference thereacross for controlling flow between said vapor outlet port and said vapor inlet port;

(c) said housing structure further including a vent port in said fluid pressure signal chamber; and

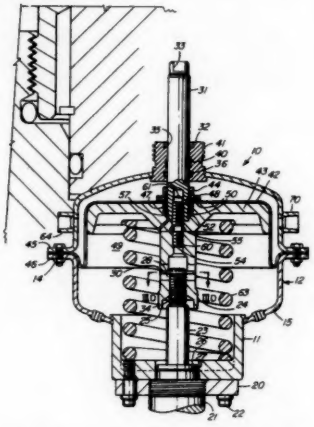
(d) an electrically operated vent valve (EVR) for controlling flow in said vent port, said vent valve having an atmospheric inlet, an outlet and valving member moveable upon electrical energization for controlling flow between said vent valve inlet and outlet, said EVR disposed to provide flow from the outlet thereof to said vent port, wherein said vent valve includes a flow restrictor for restricting flow to said vent port.

6,015,134

PNEUMATIC ACTUATOR ASSEMBLY

Clarence William Johnson, Calgary, Canada, assignor to Barber Industries Inc., Calgary, Canada

Filed Jun. 28, 1993, Appl. No. 82,579
Int. Cl.[7] **F16K** *31/126;31/122;37/00*
U.S. Cl. 251—61.4 **18 Claims**



15. A pneumatic actuator assembly comprising an actuator housing, means for connecting said actuator housing to the bonnet structure of a valve, a diaphragm movable within said actuator housing under the influence of pressurized gas and a compression spring, the position of said diaphragm extending between a first position under the influence of said pressurized gas closer to said bonnet structure and a second position under the influence of said compression spring further from said bonnet structure, said compression spring being mounted within said housing and acting in a direction opposed to the direction of said pressurized gas on said diaphragm, an indicator rod removably attached to a connector and extending through the top of said actuator housing, said connector having a bottom surface and being located below said diaphragm, said connector having an inside diameter defining a first hole, said hole being operable to be attached and removed from a valve stem extending through said bonnet structure, said connector further having an outside diameter, said connector being axially adjustable relative to said valve stem, said connector having a radial slot extending wholly through said connector from said inside diameter to said outside diameter, said slot having a width which is greater at said outside diameter of said connector than at said inside diameter, said slot having separated and opposed end surfaces and being operable to accommodate a pin extending though said valve stem and said connector and allowing a limited amount of radial play about said pin until said pin contacts said end surfaces, said

radial play allowing for a predetermined rotation of said connector relative to said valve stem when said connector and valve stem move axially under operation in said actuator assembly.

6,015,135

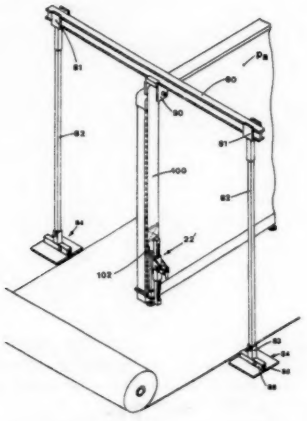
METHOD FOR SUPPORTING MODULAR FURNITURE

Jean-Guy Dubé, 147 Isabel, Hull, Province of Quebec, Canada, J8Y 5H6, and Kamal Roy Nandram, 203 Balmoral Place, Ottawa, Ontario, Canada, K1H 1B2

Division of application No. 09/066,693, Apr. 27, 1998, which is a continuation-in-part of application No. 09/034,267, Mar. 4, 1998. This application Apr. 13, 1999, Appl. No. 289,972.

Int. Cl.[7] **B66F** *00/00*

U.S. Cl. 254—1 **8 Claims**



1. A method of lifting modular furniture including panels having accessory hanging tracks to allow access to a floor, comprising:

connecting a lifting jig to one hanging track of a panel end, and using jacking means and a floor mounted vertical shaft to raise said lifting jig along said shaft to lift the panel end;

positioning a bridge member adjacent to said one hanging track, the bridge member having end supports for supporting the bridge member above the floor and providing clear space between the end supports,

slidably positioning a carrier on said bridge member, said carrier having support means, and using said support means to support said lifting jig and thereby to support the panel end; and

lifting or removing said shaft to provide access to a floor area under the bridge member and between said end supports.

6,015,136

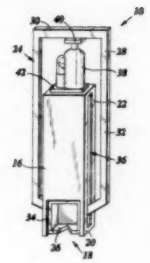
PORTABLE FASTENER REMOVER APPARATUS

Hilel Benudiz, 21931 Annette Ave., Lake Forest, Calif. 92630

Filed Jun. 15, 1998, Appl. No. 94,791

Int. Cl.[7] **B66F** *15/00*

U.S. Cl. 254—18 **25 Claims**



1. A portable fastener removal apparatus for removing an elongate fastener having an axis of radial symmetry from a structure in which the fastener is embedded, the fastener removal apparatus comprising:

a housing having an elongate channel which defines a housing axis, the housing further having a self-supporting base surface defining a plane generally perpendicular to the housing axis for contacting the structure and supporting the fastener removal apparatus against thereto, the self-supporting base surface being generally C-shaped, the housing being sized and configured to be positionable upon the structure such that the housing axis is coaxially aligned with the axis of radial symmetry;

a force transfer member movably attached to the housing and having an engagement portion which is concentrically positioned within the channel and formed to releasably engage the fastener; and

a jack attached to the housing and having a force transmission member which is cooperatively engaged to the force transfer member and reciprocally movable along a lifting axis which extends in generally parallel relation to the housing axis;

wherein the actuation of the jack subsequent to the engagement of the engagement portion to the fastener and positioning of the housing upon the structure results in the movement of the force transmission member along the lifting axis in a direction away from the structure thereby imparting a lifting force to the force transfer member which moves the engagement portion along the housing axis in a direction away from the structure thus removing the fastener from therewithin.

6,015,137

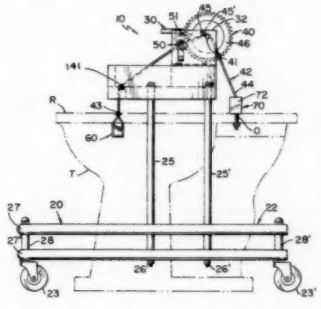
APPARATUS FOR SUSPENDING AND TRANSPORTING TOILETS

Edward Guevara, 6200 NW. 3 St., and Pedro Izquierdo, 6201 NW. 3 St., both of Miami, Fla. 33126

Filed Dec. 23, 1998, Appl. No. 220,242

Int. Cl.[7] **B66D** *1/00*

U.S. Cl. 254—323 **8 Claims**



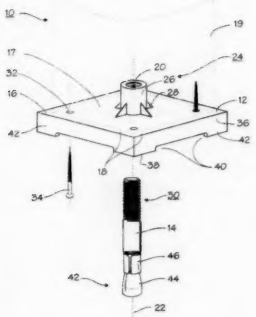
1. An apparatus for transporting toilets having a rear end with openings and a bowl with an inwardly recessed rim, comprising:

A) a wheeled chassis having a C-shape tubular member and at least one elongated structural member mounted thereon;

B) a hoist assembly mounted to said elongated structural member, said hoist assembly including a spool member with a central axle and an off-centered axle, a strap trained over said central axle and further including first and second ends having respectively, first and second attachment means for releasably securing said toilet at two attachment points and said strap is taken in by winding it over said central and off centered axles

so that said toilet is lifted substantially horizontally and transported to a desired location.

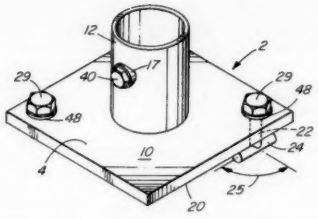
6,015,138
NEWEL POST ANCHORING DEVICE
Walter Kohlberger, and Ward Kohlberger, both of 866 Main St East, Hamilton, On, Canada, L8M 1L9
Filed Dec. 12, 1996, Appl. No. 766,176
Int. Cl.[7] E04H *17/14*
U.S. Cl. 256—65 **4 Claims**



1. In combination, a newel post assembly including a newel post and a concrete floor, the newel post assembly for erecting and anchoring the newel post to the concrete floor, comprising:
a) the newel post having a transverse bottom surface;
b) a base having a top with a periphery, a bottom load bearing surface, the top in surface engagement with the transverse bottom surface of the newel post, the load bearing surface for surface engagement with the floor such that the base transmits the load of the newel post to the floor and the base elevates the newel post above the floor to minimize deterioration of the newel post;
c) anchor means for providing a rigid anchor to the floor;
d) fastening means for securely fastening the anchor means to the base, wherein the fastening means comprises an aperture defined in the top, adapted to co-operate with and rigidly fasten to the anchor means and wherein the aperture is a threaded aperture;
e) attaching means for attaching the base to the transverse bottom surface of the newel post such that the anchor means, fastening means, and attaching means are not visible when the newel post is anchored to the floor;
f) the base further comprising a reinforcing means for reinforcing the top, the reinforcing means extending around the proximity of the periphery of the aperture; and
g) wherein the reinforcing means is a cylindrical lug being integrally part of the top and extending vertically upward from the top.

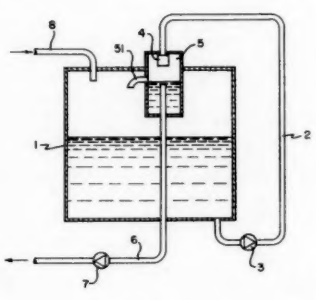
6,015,139
ANCHOR FOR GUARD RAIL SYSTEM ON STRUCTURAL GRATING FLOORS
Herbert Weber, 2604 Sandpiper Drive, Kamloops British Columbia, Canada, V2B 6G2
Filed Jul. 11, 1997, Appl. No. 893,920
Int. Cl.[7] E04H *17/00*
U.S. Cl. 256—65 **14 Claims**

1. An anchor for removably mounting a stanchion to a grating floor formed from spaced grating members comprising:
a plate having upper and lower surfaces;



a mounting location on the upper surface for releasably supporting the stanchion;
at least one locking member comprising a post extending from the lower surface with a threaded portion and a transverse member formed with notches, the transverse member being threadably receivable on the threaded portion for rotation to permit relative movement of the transverse member with respect to the post for adjustment of the distance between the transverse member and the lower surface of the plate to accommodate grating members of different dimensions, the locking member being adapted for movement between a released position that allows the post and transverse member to be introduced between and below the spaced grating members and a locked position in which the transverse member is able to engage beneath one or more of said grating members with the notches of the transverse member able to receive the grating members to releasably lock the plate onto the grating floor.

6,015,140
WETTING SYSTEMS FOR OFFSET PRINTING AND A MECHANISM FOR THEIR APPLICATION
Gerardo Antonio Romero Salvo, Zaragoza, Spain, assignor to Delta Graf S.A., Barcelona, Spain
Division of application No. 08/727,243, Oct. 8, 1996, Pat. No. 5,826,514. This application Jun. 26, 1998, Appl. No. 105,233.
Claims priority, application Spain, Oct. 19, 1995, 9502031
Int. Cl.[7] B01F *3/04*
U.S. Cl. 261—36.1 **5 Claims**



1. A mechanism for applying a wet solution to a wetting system of an offset printing machine, comprising:
a main tank containing the solution;
an outlet line having a first end and a second end, said first end of said outlet line is connected to said main tank;
a reservoir housed inside said main tank, said reservoir having walls and being disposed to receive the second end of said outlet line;
a first pump for propelling the solution through said outlet line from said main tank to said reservoir;
a nozzle connected to the second end of said outlet line and disposed so that the solution exits therefrom in a jet against the walls of said reservoir, the jet of solution sprayed out from

said nozzle produces a turbulence that allows adsorption of oxygen by the solution;

a feed line having a mouth, said feed line being connected between said reservoir and the wetting system of the offset printing machine for supplying the solution from said reservoir to the wetting system of the offset printing machine; and

a return line connected between said main tank and the wetting system of the offset printing machine for returning the solution from the wetting system of the offset printing machine to said main tank.

6,015,141

HYDRAULICALLY DAMPING SLEEVE-TYPE RUBBER SPRING

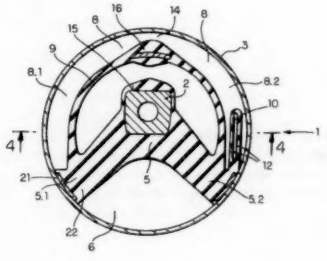
Hans-Joachim Rudolf, Stadland; Arnold Simuttis, Bad Kreuznach, and Axel Rudolph, Bensheim, all of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Jun. 4, 1997, Appl. No. 868,787

Claims priority, application Germany, Jun. 4, 1996, 196 22 248

Int. Cl.[7] **F16F** *5/00*

U.S. Cl. 267—140.12 **14 Claims**



1. A hydraulically damping device comprising:

a sleeve-type elastomeric spring, an inner support element, and an outer support element which surrounds the inner support element at a radial distance, the spring comprising a spring element of an elastomeric material arranged in a gap between the inner support element and the outer support element, the outer support element and the spring element delimiting at least one working chamber, the damping device further comprising at least one damping channel and at least one first equalization chamber which is connected to the at least one working chamber by the at least one damping channel, the at least one damping channel conducting fluid, the spring comprising an expansion wall, the first equalization chamber, when viewed in cross-section, being delimited by the outer support element and the expansion wall, the damping device comprising at least one second equalization chamber arranged in the first equalization chamber, the at least one second equalization chamber being connected with the working chamber by a connecting channel, wherein the second equalization chamber extends in the circumferential direction, and wherein the second equalization chamber is delimited on all sides by membrane-like delimitation walls made of a rubber-elastic material, and wherein the delimitation walls are spaced from the outer support element and the expansion wall by a radial distance.

6,015,142

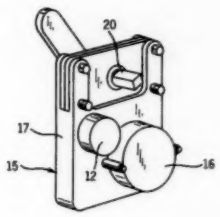
SPRING MODULE FOR RETURN-TO-NORMAL ACTUATOR

Dennis J. Ulicny, Waukesha, Wis., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Sep. 12, 1997, Appl. No. 928,870

Int. Cl.[7] **F16F** *1/14;1/06*

U.S. Cl. 267—154 **10 Claims**



1. A spring module for an actuator, said spring module comprising:

a housing;

a shaft being movable in a first direction and a second direction opposite said first direction;

a biasing element coupled to said shaft for urging said shaft in said first direction, said biasing element being energized upon movement of said shaft in said second direction and de-energized upon movement of said shaft in said first direction; and

motion limiter that limits de-energization of said biasing element; and

a speed reduction apparatus intercoupling said motion limiter and said shaft to move said motion limiter in a third direction upon movement of said shaft in said second direction and a fourth direction opposite said third direction upon movement of said shaft in said first direction, said motion limiter moving at a slower rate in said third and fourth directions than said shaft moves in said first and second directions, said speed reduction apparatus including a planetary gear assembly having a sun gear defined by said shaft, a planet gear, and a ring gear each coupled to said housing for rotation about an axis, said ring gear having a tab extending radially from said axis, said housing further including a stop engageable with said tab to define said motion limiter and to limit movement of said ring gear relative to said housing to less than one revolution about said axis.

6,015,143

AUTOMATIC DOCUMENT FEEDER HAVING UNIVERSAL OUTPUT TRAY

Juan M. Jimenez, Escondido; A. Justine Worley, Murrieta; Charles W. Dodge, Escondido, and David C. Tribolet, San Diego, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of application No. 09/041,844, Mar. 12, 1998. This application Oct. 28, 1998, Appl. No. 181,571.

Int. Cl.[7] **B65H** *5/22;1/00;31/00;* **G03G** *15/00*

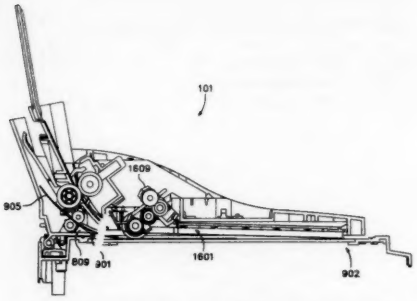
U.S. Cl. 271—4.1 **12 Claims**

1. An automatic print media feeder system comprising: a computer input device having a flat-bed document receiving surface for helping to provide a portion of a document feed path having a terminal end,

a removable document feeder overlying the document receiving surface of the input device to provide a low profile small workplace form factor system and to provide the document feed path, said removable document feeder including:

an upstanding output tray for holding at least one document;

wherein the upstanding output tray is disposed at the terminal end of the document feed path for supporting from below



only a portion of the document to facilitate the providing of said low profile small workplace form actor system;

said output tray having an insufficient height dimension relative to a height dimension of the document along its lateral axis to prevent the document from collapsing and falling from the output tray under the force of gravity;

said output tray further having a document receiving surface with a shallow concave curvature sufficient to bend the document into a sufficiently stiff semi-cylindrical form along its lateral axis to prevent the document from collapsing and falling from the output tray under the force of gravity; and

alignment means mounted adjacent to said output tray for aligning the output tray and document feed path with the document supporting surface of the input device and for enabling the removable document feeder to be raised and lowered parallel to the document supporting surface without removing said document feeder from the input device.

6,015,144

SHEET FEEDER AND IMAGE FORMING APPARATUS

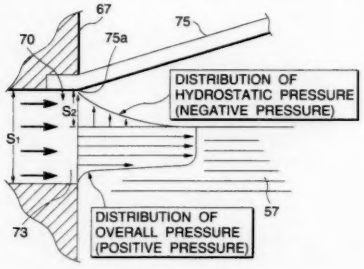
Hajime Yoshii, and Takuo Matsumura, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1998, Appl. No. 59,334

Claims priority, application Japan, Apr. 18, 1997, 9-101194; Nov. 25, 1997, 9-322648; Dec. 5, 1997, 9-335221

Int. Cl.[7] B65H *3/14*

U.S. Cl. 271—97 **3 Claims**



1. A sheet feeder comprising:

air blowing means which blows air from a direction of side edges of a stack of sheets loaded in a predetermined location;

paper feed means which separates one sheet from the stack of sheets to which air is blown by the air blowing means and which feeds the thus-separated sheet from the predetermined location; and

air flow regulation means which is provided in an elevated position above the stack of sheets loaded in the predetermined location and which regulates the passage of the air flow blow toward the stack of sheets from the air blowing means, the air flow regulation means having a shape which regulates the air flow in such a way that a maximum negative pressure is produced from the air flow blown by the air blowing means in an area above an upper surface of the sheet in a vicinity of the side edges of the stack of sheets.

6,015,145

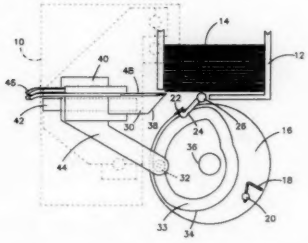
SEPARATOR GUIDE FOR Z-FOLDED SHEETS

Siegfried Hartel, 210 Normandy Dr., Brunswick, Ohio 44212

Filed Nov. 3, 1997, Appl. No. 963,204

Int. Cl.[7] B65H *3/26*

U.S. Cl. 271—98 **14 Claims**



1. For use with a single pocket of a saddle stitcher including a frame, a stacking tray, suction take-off means to remove sheets of paper, one at a time from the stacking tray, a cylindrical gripper disc mounted on a rotating shaft, gripper means on the gripper disc for clamping the leading edge of a sheet of paper, and a saddle shuttle,

a separator guide for an outside Z folded sheet, said sheet comprising first and second flaps joined at a first fold and second and third flaps joined at a second fold, wherein the free edge of the third flap terminates in close proximity to, but short of the first fold, the Z-folded sheet placed on the stacking tray with the first fold forming the leading edge of the sheet as the sheet is withdrawn from the stacking tray and is transferred to the saddle shuttle, said device comprising:

a) a cam mounted on the shaft on one side of the gripper disc;

b) a cam follower operatively engaging the cam;

c) means for translating the motion of the cam follower into reciprocating linear motion;

d) at least one sheet guide connected to the translating motion means movable linearly toward the gripper disc after a first flap of the Z-folded sheet is removed from the stacking tray by the suction take-offs; and

e) pneumatic means to deflect the edge of the third flap into contact with the guide to cause the flap to be biased toward, and clamped by the gripping means along with the first fold of the sheet.

6,015,146

CURL SENSITIVE BOTTOM VACUUM CORRUGATION FEEDER

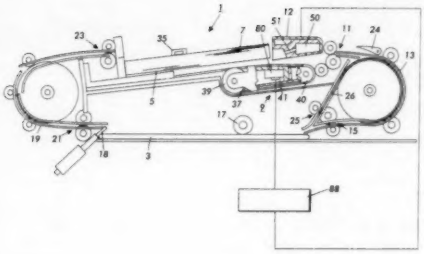
Robert P. Siegel, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 8, 1998, Appl. No. 4,252

Int. Cl.[7] B65H *3/48*

U.S. Cl. 271—98 **1 Claim**

1. A bottom sheet separator-feeder for separating and forwarding sheets seriatim from the bottom of a stack of sheets to be fed including curled sheets, in feed cycles, during a portion of which sheet acquistion occurs for different sheets at different times comprising: a stacking tray having a surface for supporting a stack of sheets to be fed; a variable pressure air knife positioned opposite the sheet stack and adapted to separate the bottommost sheet in the stack from the remainder of the stack; a plurality of apertured endless vacuum feed belts extending through at least the front end



of said sheet stacking tray for acquiring and advancing the bottom sheet of the stack; said plurality of apertured endless vacuum feed belts extending across a vacuum chamber that includes a support plate for supporting said belts having vacuum ports therein for applying a variable negative vacuum pressure at the back of and through said belts; and an arrangement for adjusting the air pressure of the air knife against the stack regardless of sheet stack size, sheet weight or sheet curl, said arrangement including a vacuum pressure sensor positioned within said vacuum chamber and adapted to give off instantaneous electrical signals, relative to a reference value electrical signal, proportional to the degree of vacuum behind said apertured belts for detecting the point at which said sheet acquisition has occurred, and wherein said pressure sensor is interrogated at multiple predetermined time intervals during said acquisition portion of said feed cycle, and at each said interval, said degree of vacuum detected in said vacuum chamber by said vacuum pressure sensor is compared to said reference value for said interval to determine whether said degree of vacuum within said vacuum chamber is above or below said reference value, and a microprocessor controller adapted to receive said signals from said pressure sensor to determine when said acquisition has occurred and to either decrease or increase said air knife pressure or said vacuum pressure in order to maintain said sheet acquisition time within a preset nominal window within a said feed cycle regardless of stack size, paper weight or paper curl.

6,015,147

PAPER SHEET MANIPULATING APPARATUS AND PAPER SHEET TRANSACTION APPARATUS

Atsunori Kimura; Yoichi Ono; Hayato Minamishin; Yuji Tanaka; Seiichi Ohno; Hidekazu Hata, all of Kawasaki; Hiroyuki Ueda; Isamu Esaki, both of Inagi, and Atsushi Uchida, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP95/00799, § 371 Date Sep. 19, 1995, § 102(e) Date Sep. 19, 1995, PCT Pub. No. WO95/32486, PCT Pub. Date Nov. 30, 1995

PCT Filed Apr. 24, 1995, Appl. No. 513,879

Claims priority, application Japan, May 20, 1994, 6-107303; Feb. 16, 1995, 7-028228

Int. Cl.[7] **B65H** *1/00*

U.S. Cl. 271—163 **17 Claims**

1. A paper sheet manipulating apparatus, comprising:

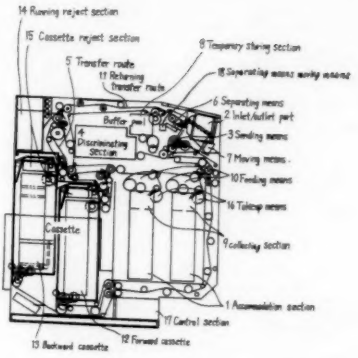
an inlet port into which the paper sheets are placed by a customer;

a transfer mechanism for transferring the paper sheets inside of said apparatus having feeding mechanism and discharging mechanism for feeding and discharging the paper sheets from and to said inlet port;

a sending means for sending paper sheets from said inlet port to said transfer mechanism;

a member movable between a projected position and a non-projected position within said inlet port; and

a means for moving said member to the projected position within the inlet port on the occasion of sending the paper sheets from said inlet port to the transfer mechanism in order to keep the remaining paper sheets, which should be fed from



said inlet port said by sending means, separate from the paper sheets discharged to said inlet port.

6,015,148

LASER BEAM PRINTER WITH VARIABLE PAPER FEEDING CAPACITY

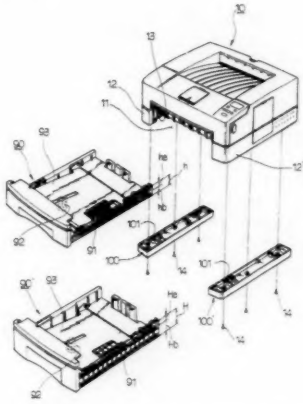
Won-Mo Cho, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 27, 1997, Appl. No. 864,270

Claims priority, application Rep. of Korea, May 25, 1996, 96-17857; May 8, 1997, 97-17571

Int. Cl.[7] **B65H** *1/08; 1/00*

U.S. Cl. 271—164 **20 Claims**



1. A method of assuring supply of paper to a printer with variable paper feeding capacity, comprising the steps of:

providing a body; forming a cassette mounting portion disposed on bottom side of said body, having a paper feeding device, a plurality of sidewalls with a first height, and cassette mounting rails forming, and providing a first space between said sidewalls;

forming a minimum capacity paper cassette having a first paper holding portion of a first paper holding capacity, first cassette channels permitting said cassette mounting rails to slide, and the same height as said first height of said sidewalls, and being accommodated into said first space;

forming a large capacity paper cassette having a second paper holding portion of a second paper holding capacity greater than said first paper holding capacity, second channels permitting said cassette mounting rails to slide, and a second height

longer than said first height of said sidewalls and occupying a second space larger than said first space; and

providing a plurality of height compensators attached to said side walls, having approximately same height as difference in height between said first height and said second height and approximately same as difference in space between said first space and said second space so as to accommodate said large capacity paper cassette when said large capacity paper cassette is inserted into said cassette mounting portion in place of said minimum capacity paper cassette.

6,015,149

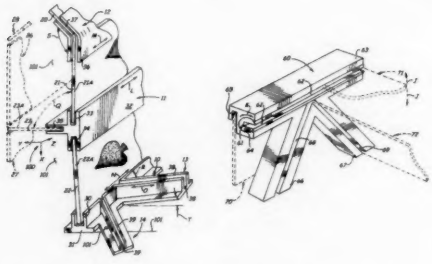
CARD STACKING GAME

Kent P. Burk, 616 W. Baseline, Tempe, Ariz. 85283

Filed Feb. 2, 1998, Appl. No. 27,390

Int. Cl.[7] **A63F** *1/00;* **A63H** *33/08*

U.S. Cl. 273—148 A **1 Claim**



1. A card stacking game for constructing a structure of cards, including

(a) a plurality of cards; and,

(b) a card holder shaped and dimensioned to receive at least one of said cards and including at least one movable part which permits the orientation of said one of said cards to be altered.

6,015,150

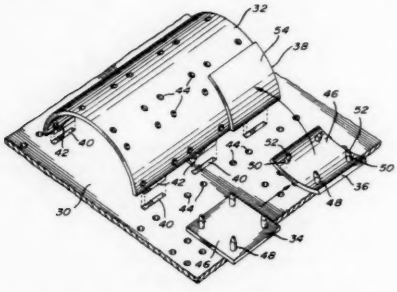
THREE-DIMENSIONAL PUZZLE ASSEMBLY

Marcel Giguère, 102, rue de l'Esplanade, Saint-Philémon, Québec, Canada, G0R 4A0

Filed Sep. 24, 1997, Appl. No. 937,148

Int. Cl.[7] **A63F** *9/12*

U.S. Cl. 273—157 R **23 Claims**



1. A three-dimensional puzzle assembly comprising:

a structural portion including a plurality of generally flat structural elements provided with at least one first interconnecting means; said plurality of generally flat structural elements being configured and sized to be interconnected to define a predetermined three-dimensional shape;

a decorative portion including a plurality of generally flat decorative elements made of a resilient material and provided with a front decorative surface and a reverse surface; said reverse surface of each said generally flat decorative element being provided with at least one second interconnecting means; each said second interconnecting means being so configured as to interconnect with one of said first interconnecting means to thereby releasably maintain said generally flat decorative element to said structural element; said resiliency of said generally flat decorative elements allows said decorative elements to be bent as to follow said predetermined three-dimensional shape of said structural portion.

6,015,151

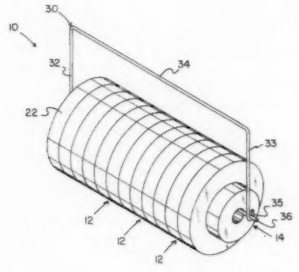
BOCCE BALL TYPE GAME DEVICE

G. Walter Carovillano, and Carrie A. Carovillano, both of 182 Willson Rd, Welland, Ontario, Canada, L3C 2T6

Filed May 28, 1998, Appl. No. 86,443

Int. Cl.[7] **A63B** *67/06;* **A63D** *1/00*

U.S. Cl. 273—317 **11 Claims**



1. A bocce ball-type game apparatus, comprising:

a plurality of discs including a number of tossing discs and a marker disc;

each disc having a center, generally circular first and second faces, and a perimeter side edge between said first and second faces of said disc;

each disc having a generally cylindrical bore being extended between said first and second faces;

each disc having a diameter;

each disc having a thickness defined between said first and second faces of said disc;

a disc carrier comprising:

a generally U-shaped elongate handle rod having a pair of elongate arms and an elongate crossbar, each of said elongate arms of said handle rod having a terminal end;

an elongate carrying rod having a pair of opposite ends, one of said ends of said carrying rod being coupled to said terminal end of one of said arms of said handle rod, said carrying rod being extended from said one of said arms of said handle rod towards another of said arms of said handle rod;

said terminal end of said another of said arms of said handle rod having a hook formed thereat, a portion of said carrying rod being insertable into said hook such that said carrying rod is attached to said another of said arms of said handle rod; and

another of said ends of said carrying rod being insertable through said bores of said discs such that said carrying rod is extended through said bores of said discs.

6,015,152

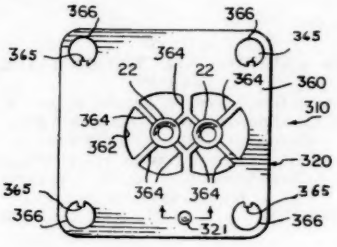
SEAL RETAINER HAVING AN INDICATOR

Jeffrey E. Swensen; Terence J. Nolan, both of Eldersburg; J. Loyd Spence, Elkridge, and Edward P. Rhyne, Columbia, all of Md., assignors to EG&G Pressure Science, Inc., Beltsville, Md.

Continuation-in-part of application No. 08/778,633, Jan. 3, 1997, Pat. No. 5,713,582. This application Dec. 29, 1997, Appl. No. 998,595.

Int. Cl.[7] F16J *15/00*

U.S. Cl. 277—321 **24 Claims**



1. A seal retainer for coupling at least one seal thereto, comprising:

a substantially flat, flexible body portion lying in a plane and with at least one seal receiving aperture;

an indicator integrally formed with said body portion as a one-piece, unitary member, said indicator being a deformable member which extends outwardly from said plane of said body portion; and

at least one resilient retaining element integrally formed with said body portion as a one-piece, unitary member, said at least one retaining element being formed substantially in said plane of said flexible body and extending inwardly from said body portion into said at least one seal receiving aperture to a free end.

6,015,153

LABYRINTH SEALING DEVICE AND METHOD OF ASSEMBLY

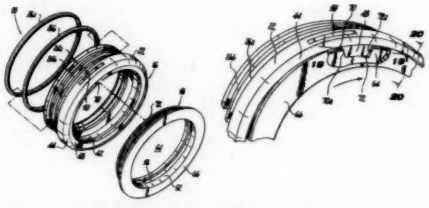
Kenneth J. Sharrer, Waterloo, N.Y., assignor to Garlock Inc, Palymra, N.Y.

Continuation of application No. 08/869,692, Jun. 5, 1997, Pat. No. 5,908,195, Provisional application No. 60/028,103, Oct. 9, 1996. This application May 4, 1999, Appl. No. 304,688.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] F16J *15/447*

U.S. Cl. 277—412 **3 Claims**



1. A dynamic sealing device for placement between a rotating shaft and a bearing housing comprising:

a) an annular stator having a body portion and a cover portion, said cover portion having a radially inner engagement portion associated therewith; and

b) an annular rotator having a radially outer engagement portion surrounded by said cover portion and operatively connected with said radially inner engagement portion of said stator, said stator having a radial sealing lip protecting from a radially outer leading edge of said cover portion for sealingly engaging a leading edge portion of said rotator, said sealing lip being relatively flexible with respect to said cover portion, wherein said sealing lip is adapted and configured to deflect radially outwardly to receive and engage said leading edge portion of said rotator during assembly.

6,015,154

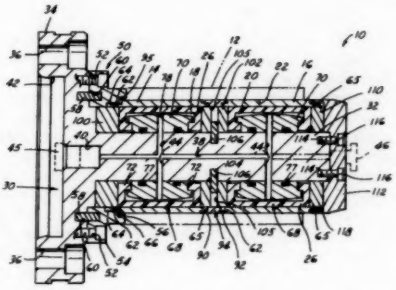
LARGE DISPLACEMENT HYDROSTATIC WORKPIECE HOLDER

William M. Andre, Rochester Hills, Mich., and Bruce W. Irwin, Sr., Fort Pierce, Fla., assignors to Hydra-Lock Corporation, Mt. Clemens, Mich.

Filed May 28, 1998, Appl. No. 85,953

Int. Cl.[7] B23B *31/30;31/40*

U.S. Cl. 279—2.07 **19 Claims**



1. An apparatus to releasably retain a workpiece with a generally cylindrical surface comprising:

a body;

at least two spaced apart and separate polymeric rings carried by the body, each polymeric ring defining at least in part a fluid chamber constructed to contain a fluid; and

two separate annular, generally cylindrical metal sleeves each formed with at least one slot and having an inner surface and an outer surface, each sleeve carried by the body with at least one polymeric ring adjacent to and engageable with one of the inner or outer surfaces of each sleeve and the other of the inner and outer surfaces of each sleeve being constructed to receive and directly engage a workpiece, and the slots enabling each sleeve to undergo a change in diameter of as much as at least 0.10 of an inch to firmly engage a workpiece, one sleeve being disposed adjacent each end of the workpiece when the workpiece is received by the sleeves, whereby when the fluid in the fluid chamber is pressurized, the force of the pressurized fluid is transmitted through the polymeric ring to the sleeve to urge the sleeve into firm engagement with the workpiece to firmly hold the workpiece.

6,015,155

MOTOR VEHICLE SUSPENSION SYSTEM

Graham Robert Brookes, Redditch; David Andrew Clare, Solihull; Phillip James Green, Nuneaton; Richard John Smith, Coventry, and Richard Graham Woodhouse, Birmingham, all of United Kingdom, assignors to Rover Group Limited, Warwick, United Kingdom

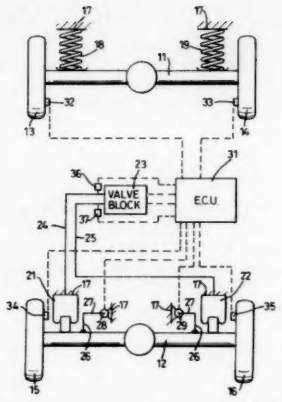
Filed May 27, 1997, Appl. No. 863,237

Claims priority, application United Kingdom, Sep. 29, 1996, 9611119

Int. Cl.[7] B60G *17/01*

U.S. Cl. 280—5.505 **21 Claims**

1. A suspension system for a motor vehicle having front wheels and rearwheels, the suspension system comprising front suspension units for supporting a weight of the vehicle on the front wheels and



rear suspension units for supporting the weight of the vehicle on the rear wheels, each suspension unit of at least one of the front suspension units and the rear suspension units being operative to adjust a ride height between sprung and unsprung parts of the vehicle adjacent to each operative suspension unit, control means being operatively connected to the operative suspension units for monitoring and maintaining each ride height at a particular setting for providing, as necessary each operative suspension unit with a respective up height change signal to increase the ride height and a respective down height change signal to decrease the ride height, and wheel speed monitoring means for monitoring wheel speeds on at least two of said front and rear wheels, the control means being operative to provide a corrective up height change signal in the event of an unrequested ride height increase which is not in response to a height change signal and there existed before the unrequested ride height increase a wheel speed signal indicative of vehicle movement.

6,015,156

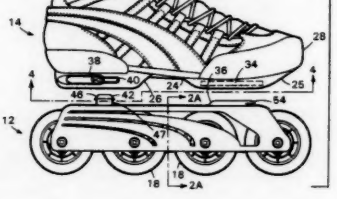
SKATE WITH DETACHABLE BOOT

Michael K. Pratt, Worcester, Mass., assignor to Seneca Sports, Inc., Milford, Mass.

Filed Jun. 11, 1998, Appl. No. 96,235

Int. Cl.[7] A63C *17/02*

U.S. Cl. 280—11.22 **14 Claims**



1. An in-line skate comprising

a wheeled chassis having an elongated frame and a multiplicity of wheels mounted to the frame, the frame having

a projection extending therefrom, the projection having a stem and an overhanging head at the distal end of the stem, and

an elongated rib extending therefrom, in spaced relation to the projection along the length of the frame, the rib having a cantilevered extension; and

a boot adapted for releasable attachment to the chassis, the boot comprising an upper attached to a flexible sole having a tread for walking upon, the sole defining therein

a slot adapted to receive the rib of the frame, the slot defining an undercut at one end thereof for retaining the cantilevered extension of the rib to resist separation of the attached boot and chassis, the sole further comprising

a movable clip positioned to receive and releasably engage the projection to resist separation of the attached boot and chassis.

6,015,157

ROLLER SKATE ADAPTABLE TO USER, STYLE, AND TERRAIN

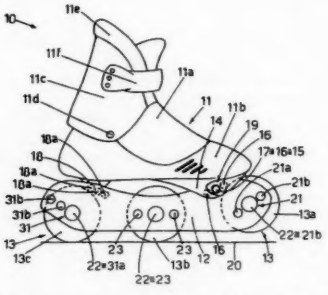
Kurt Hilgarth, Graz-Sciersberg, Austria, assignor to Fancyform Design Engineering, Graz-Grambach, Austria

Filed Apr. 1, 1997, Appl. No. 831,082

Claims priority, application Austria, Apr. 1, 1996, 183/96 U; Italy, Sep. 20, 1996, UD96A0177; Dec. 20, 1996, UD96A0246

Int. Cl.[7] A63C *1/00*

U.S. Cl. 280—11.27 **18 Claims**



1. Roller skate comprising a body of a shoe (**11**) wherein a skater's foot and part of a leg are housed, associated with a support (**12**) on which skating elements (**13**) are mounted, there being included at least a front skating element (**13***a*), a middle skating element (**13***b*) and a rear skating element (**13***c*), the roller skate being characterized in that the shoe (**11**) is constrained to the support (**12**) at least by means of an articulated oscillation connection (**19**) and cooperates with the support (**12**) by means of a guide element (**18**), the roller skate being further characterized in that the skating elements (**13**) have a diameter of between 90 and 120 mm and the support (**12**) includes assembly seatings for the skating elements (**13**) defining a first position where the skating elements (**13**) are substantially aligned, and a second position of vertical limit where at least the front skating element (**13***a*) is in a raised position with respect to a skating surface (**20**), by a value at least one-sixth of the diameter of the middle skating elements (**13***b*) and in any case not less than 15 mm from the skating surface (**20**), the roller skate being further characterized in that the assembly seatings for the front skating element (**13***a*) consist of housing holes (**21**) for a relative rotation pin (**22**), the housing holes (**21**) having substantially the same section as the relative rotation pin (**22**).

6,015,158

HEAVY DUTY TRUCK SUSPENSION

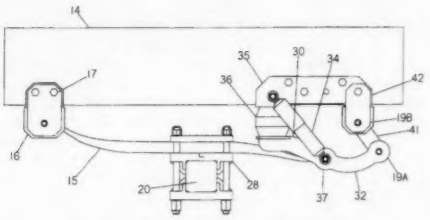
Jerry Overby, Sioux Falls, S. Dak., assignor to Timbren Industries Inc., Ajax, Canada

Filed Jun. 24, 1998, Appl. No. 103,854

Int. Cl.[7] B60G *11/34*

U.S. Cl. 280—124.163 **2 Claims**

1. A front axle suspension system for heavy load carrying vehicles, said vehicles including a body, a frame and a wheel axle beam mounted transverse to said frame, said suspension system comprising;

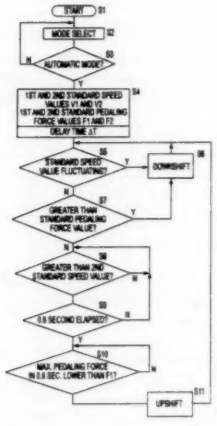


a) an elongated leaf spring having a forward end, a mid-section and a rear end;
b) means connecting said forward end of said leaf spring to said vehicle frame for pivotal movement of said leaf spring about a first axis extending transversely of said frame;
c) means connecting said mid-section of said leaf spring to said axle beam;
d) an equalizer assembly including a lever arm having a a forward end, a center section and a rear end, said lever having its center section pivotally mounted on said rear end of said leaf spring;
e) a rubber spring mounted on said forward end of said lever arm, said rubber spring bearing upwardly against said frame;
f) a shock absorber having first and second ends, said first end being mounted at said center section of said lever arm and said second end being mounted to said frame for absorbing jounce forces, and
g) a pivoting shackle having a first and second ends, said first end being mounted on said rear end of said lever arm, and said second end being pivotally mounted on said frame.

6,015,159
METHOD AND APPARATUS FOR SHIFTING A BICYCLE TRANSMISSION

Nobuyuki Matsuo, Shimonoseki, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Sep. 11, 1997, Appl. No. 927,920
Claims priority, application Japan, Sep. 20, 1996, 8-271434
Int. Cl.[7] B62M *9/00*
U.S. Cl. 280—238 **31 Claims**

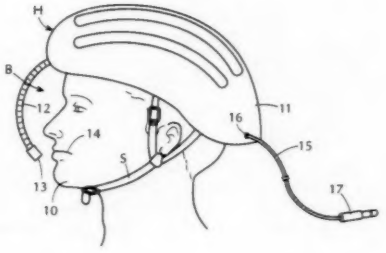


1. A bicycle shift control apparatus comprising:
a pedaling force determining unit for determining a pedaling force exerted on a pedaling member; and
a shift stage determining unit which determines an optimum shift stage of a bicycle transmission from the pedaling force, wherein the shift stage determining unit includes a memory for storing a first pedaling force value and a second pedaling force value for a given shift stage, wherein the second pedaling force value is greater than the first pedaling force value.

6,015,160
COMBINED SAFETY HELMET AND PA SYSTEM

Donald Spector, 380 Mountain Rd., Union City, N.J. 07080

Continuation-in-part of application No. 08/958,339, Oct. 27, 1997, which is a continuation-in-part of application No. 08/827,949, May 2, 1997, Pat. No. 5,842,714. This application Apr. 27, 1998, Appl. No. 67,266.
Int. Cl.[7] B64H *1/00*
U.S. Cl. 280—288.4 **8 Claims**



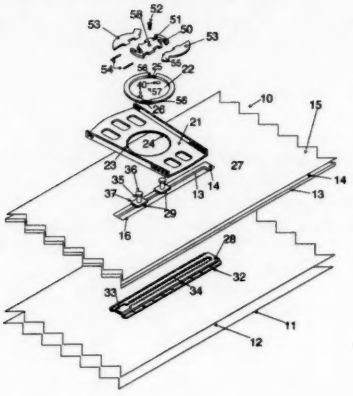
1. A safety helmet for a bicyclist combined with a public address system making it possible for the bicyclist to broadcast as he rides his bicycle, said combination comprising:
A. a safety helmet having a microphone extending therefrom mounted on a flexible tubular support anchored on the helmet to occupy a position adjacent the mouth of the bicyclist, said microphone being connected to a line extending from the helmet through the support to an external terminal; and
B. a unit adapted to be attached to the bicyclist including an amplifier having an input connected to said terminal and a loud speaker connected to an output of said amplifier whereby when the bicyclist speaks into the microphone, his speech is reproduced and broadcast by said loud speaker.

6,015,161
LONGITUDINALLY ADJUSTABLE MOUNT FOR A SNOWBOARD BINDING

Stephen R. Carlson, 798 Brooktree Rd., Pacific Palisades, Calif. 90272

Filed Jul. 28, 1997, Appl. No. 901,387
Int. Cl.[7] A63C *9/10*
U.S. Cl. 280—626 **3 Claims**

1. A combination snowboard, binding and mount comprising:
a. a snowboard having a center-line wherein said snowboard has a channel longitudinally extending along said center-line;
b. a rail disposed in said channel and fixedly coupled thereto wherein said rail has at least one series of notches;
c. a binding base plate disposed on said snowboard;
d. a disc having a center-line and a bottom surface on which a bar is disposed about said center-line thereof and fixedly coupled thereto with said bar having at least one peripheral edge which has a series of notches which engages said series of notches of said rail, said disc being rotatably coupled to said binding base plate; and



e. a locking mechanism securely coupling said rail to said disc.

6,015,162

RESTRAINT SYSTEM FOR PASSENGERS IN VEHICLES

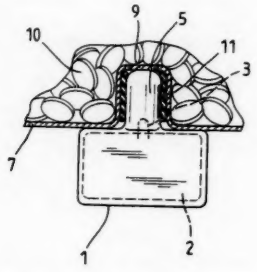
Hans Spies, Pfaffenhofen, and Horst Daxer, Munich, both of Germany, assignors to DaimlerChrysler AG, Heilbronn, Germany

Continuation-in-part of application No. 07/747,126, Aug. 19, 1991, abandoned. This application May 21, 1993, Appl. No. 65,857.

Claims priority, application Germany, Aug. 23, 1990, 40 26 697

Int. Cl.[7] **B60R** *21/32*

U.S. Cl. 280—735 **7 Claims**



1. A vehicle's restraint system for passengers such as airbags, belt tighteners or similar devices to protect the passengers in case of a crash against injury, the system comprising:

a gas generator having a normally closed first housing including a solid fuel as a charge to generate gas;

electric ignition means for initiating ignition of said charge;

evaluating means connected to said ignition means, said evaluating means including an acceleration-responsive signal generator for detecting when at least one predetermined threshold is exceeded and then activating said ignition means by triggering means for generating a triggering impulse;

a closed second housing defining a vessel which is separate from said first housing, said evaluating means, said triggering means and said ignition means being incorporated in said closed second housing, said closed second housing including a portion which makes contact with said first housing, positioning said ignition means adjacent to said charge in said first housing.

6,015,163

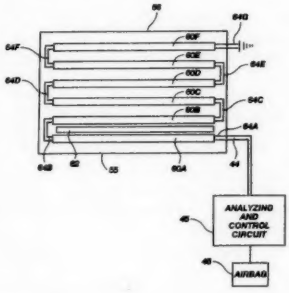
SYSTEM FOR MEASURING PARAMETERS RELATED TO AUTOMOBILE SEAT

Gordon B. Langford, 11193 S. Star Cir., Sandy, Utah 84092; Cesar A. Montano, 450 N. Canyon Rd., Pleasant Grove, Utah 84062; Doug Odom, 6906 S. 300 West, Midvale, Utah 84047; Thomas Danielson, 6906 S. 300 West, Midvale, Utah 84047; Richard Allen, 6906 S. 300 West, Midvale, Utah 84047; Greg Putnam, 6906 S. 300 West, Midvale, Utah 84047, and David Beck, 6906 S. 300 West, Midvale, Utah 84047

Provisional application No. 60/028,448, Oct. 9, 1996. This application Oct. 8, 1997, Appl. No. 947,001.

Int. Cl.[7] **B60R** *21/32*

U.S. Cl. 280—735 **5 Claims**



1. A sensor system comprising:

a surface configured to receive and support a weight having a mass and a foot print, said surface being formed of a material which deflects in a pattern reflective of said mass and said foot print between a first position without said weight on said surface and a second position with said weight on said surface;

an array of flexible potentiometers each having an electrical resistance that predictably varies upon deflection from a first position to a second position, said array of flexible potentiometers being positioned under said surface, each of said flexible potentiometers being positioned to move from its first position to its second position to sense the deflection of said surface in said pattern between the first position of said surface and the second position of said surface and to generate deflection signals reflective of said pattern; and

a circuit means connected to receive said deflection signals reflective of said pattern and to supply a control signal to an exterior receiver, said circuit means having means to process said deflection signals reflective of said pattern and to generate said control signal.

6,015,164

SEAT BELT DEVICE

Hideaki Yano, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Feb. 17, 1998, Appl. No. 24,512

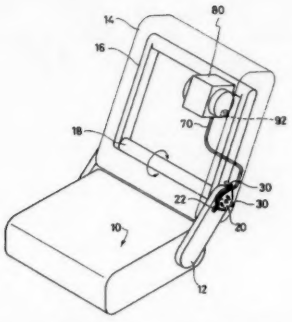
Claims priority, application Japan, Feb. 18, 1997, 9-033732

Int. Cl.[7] **B60R** *22/36*

U.S. Cl. 280—806 **11 Claims**

1. A seat belt device attached to a seat with a seat back and a seat cushion, comprising:

a seat belt retractor including a retractor frame adapted to be attached to the seat back, a reel attached to the retractor frame for winding a seat belt, a locking mechanism attached to the retractor frame for locking a rotation of the seat belt in a withdrawing direction, and an acceleration sensor for activating the locking mechanism, said acceleration sensor being supported on the retractor frame to tilt around a horizontal axis and having a sensor weight which tilts due to an acceleration in a horizontal direction,



a rotor engaging the acceleration sensor for controlling a posture of the acceleration sensor, said rotor allowing the acceleration sensor to align vertically,

a rotational member adapted to be attached to a support for the seat, said rotational member rotating corresponding to an inclination of the seat back, and

a connecting member connecting the rotational member and the rotor so that the acceleration sensor always orients vertically regardless of an inclined angle of the seat back.

6,015,165

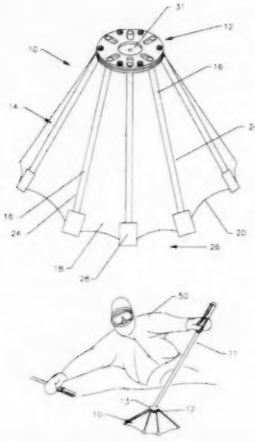
WEIGHT DISPERSION AND SUPPORT DEVICE

Chris A. Artemis, 16359 W. 10th Ave. #W4; William P. Mentgen, 1185 Orchard St., both of Golden, and Daniel A. Joseph, 9629 W. Chatfield Ave., Littleton, all of Colo. 80123

Filed Jul. 8, 1997, Appl. No. 889,413

Int. Cl.[7] **A63C** *11/24*

U.S. Cl. 280—824 **14 Claims**



1. A weight dispersion and support device for use with a ski pole on an unstable support surface, comprising:

attachment means for fitted engagement with the distal end of said ski pole;

an umbrella-like support base adapted to be opened and closed and having a plurality of support spines pivotally connected to said attachment means and extending outwardly and downwardly therefrom and an outer covering surrounding and supported by said spines, said support base including a support-surface contacting peripheral edge for engagement with said unstable support surface when said device is in the opened state.

6,015,166

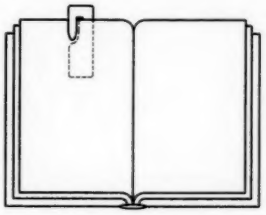
BOOKMARK

Robert M. May, 67 Richland Crescent, Etobicoke, Ontario, Canada, M9C 4C4

Filed Feb. 24, 1997, Appl. No. 855,753

Int. Cl.[7] **B42D** *9/00*

U.S. Cl. 281—42 **12 Claims**



1. A bookmark which is asymmetrical and comprises at least three elements:

a. a stabilizer(**1**)

b. a marker(**2**)

c. a connector(**3**)

and where:

said stabilizer(**1**) is as long as the distance that said stabilizer(**1**) can project into the margin of the page of a book, when said stabilizer(**1**) is on the top of a page and said marker(**2**) is on the bottom or obverse side of the page, so that said marker and said stabilizer are clenching a page, and said stabilizer(**1**) is more than one centimeter longer than said marker(**2**)

And said marker(**2**) is more than one centimeter long, and the length of said marker(**2**) is determined by measuring from the edge of a clenched page to the furthest point from the page margin, when said marker(**2**) is on the top of a page and said stabilizer(**1**) is on the bottom or obverse side of the page,

And said connector(**3**) always remains beyond the page margin when each of said stabilizer(**1**) and said marker(**2**) are positioned on the front and back sides of a page, so that the page is between said stabilizer(**1**) and said marker(**2**),

and said bookmark is a rigid-planar or semi-rigid-planar object and is the means to mark a page of interest in a book, magazine or manual, to a reader and said bookmark clenches a sheaf of pages by a wedging or flexing action of said elements and the reader may slide said bookmark so that said marker(**2**) is clear of the page-margin of a book while said stabilizer(**1**) remains within the page-margin of the book.

6,015,167

SYSTEM AND METHOD OF EMPLOYING A SINGLE BAR CODE FOR COORDINATING SHIPPING AND RECEIVING INFORMATION

John E. Savino; Thomas P. Gallagher, both of Manchester, Conn.; Barbara Reid Macy, Longmeadow, Mass.; Michael John Scully, Ellington; Elizabeth D. Toney, Stafford Springs, both of Conn.; Ernest R. Harlow, Westfield, and James W. Naglieri, East Longmeadow, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

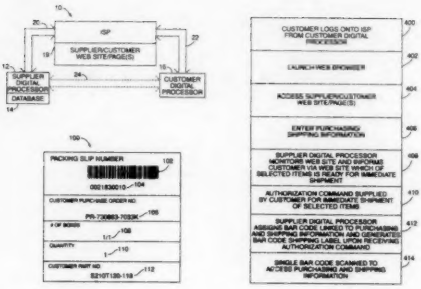
Filed Aug. 14, 1998, Appl. No. 134,570

Int. Cl.[7] **B42D** *15/00*

U.S. Cl. 283—67 **10 Claims**

1. A method of employing a single bar code shipping label for coordinating shipping and receiving information between supplier and customer, comprising the steps of:

accessing a supplier digital processor including a parts database from a customer digital processor via a digital communication link;


ISP
SUPPLIER/CUSTOMER WEB SITE/PAGE(S)
SUPPLIER DIGITAL PROCESSOR DATABASE
CUSTOMER DIGITAL PROCESSOR
PACKING SLIP NUMBER
CUSTOMER PURCHASE ORDER NO.
QUANTITY
CUSTOMER PART NO.
CUSTOMER LOGS ONTO ISP FROM CUSTOMER DIGITAL PROCESSOR
LAUNCH WEB BROWSER
ACCESS SUPPLIER/CUSTOMER WEB SITE/PAGE(S)
ENTER PURCHASING/SHIPPING INFORMATION
SUPPLIER DIGITAL PROCESSOR MONITORS WEB SITE AND INFORMS CUSTOMER VIA WEB SITE WHICH OF SELECTED ITEMS IS READY FOR IMMEDIATE SHIPMENT
AUTHORIZATION COMMAND SUPPLIED BY CUSTOMER FOR IMMEDIATE SHIPMENT OF SELECTED ITEMS
SUPPLIER DIGITAL PROCESSOR ASSIGNS BAR CODE LINKED TO PURCHASING AND SHIPPING INFORMATION AND GENERATES BAR CODE SHIPPING LABEL UPON RECEIVING AUTHORIZATION COMMAND
SINGLE BAR CODE SCANNED TO ACCESS PURCHASING AND SHIPPING INFORMATION

selecting and entering purchase and shipping information associated with a purchase order from items provided in the parts database;

authorizing from the customer digital processor to the supplier digital processor the immediate shipment to the customer of the purchase order by means of an authorization command; and

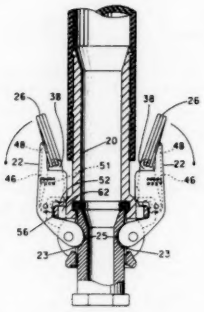
generating a single bar code on a shipping label in response to the authorization command, whereby the single bar code is linked to a plurality of predetermined relevant purchase and shipping information associated with the purchase order.

6,015,168

PIVOTAL LOCK FOR COUPLING CAM ARMS

Richard L. Fahl, Fairfield, Ohio, assignor to Dover Corp., New York, N.Y.

Filed May 8, 1997, Appl. No. 853,100
Int. Cl.[7] F16L *37/00*
U.S. Cl. 285—81 **29 Claims**



1. An assembly for selectively interlocking two coupling members, comprising:

a cam arm having first and second ends, the cam arm being adapted to be pivotally connected to a first coupling member, the cam arm having a cam surface at the first end adapted to selectively interface with a second coupling member for securing the second coupling member with respect to the first coupling member when the cam arm is in a locked position, the cam arm being rotatable in a first rotational direction from the locked position to an unlocked position;

a locking member, the locking member being pivotally connected to the cam arm about a pivotal axis, the locking member being pivotally movable relative to the cam arm and being adapted to selectively engage a structure on the first coupling member to prevent rotation of the cam arm relative to the first coupling member when the cam arm is in the locked position, wherein the locking member is rotatable in the first rotational direction to disengage the locking member from the structure, and wherein the locking member includes only one lever arm; and

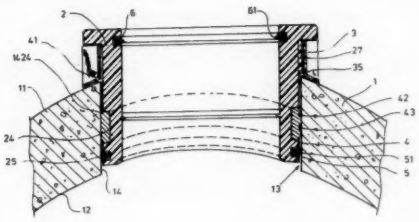
a biasing mechanism extending between the locking member and the cam arm, the biasing mechanism being adapted to bias the locking member to a predetermined pivotal position with respect to the cam arm, wherein the locking member is adapted such that a continuous rotation of the locking member in the first rotational direction i) disengages the locking member from the structure, ii) applies force to a contact surface on the cam arm, and iii) rotates the cam arm toward the unlocked position.

6,015,169

CONNECTOR FOR CONCRETE PIPES

Hans-Gunter Funke, and Norbert Funke, both of Sendenhorst, Germany, assignors to Kunst-Stoffrohren Sedenhorst GmbH, Sedenhorst, Germany

PCT No. PCT/EP97/01232, § 371 Date Apr. 27, 1998, § 102(e) Date Apr. 27, 1998, PCT Pub. No. WO97/36128, PCT Pub. Date Oct. 2, 1997
PCT Filed Mar. 11, 1997, Appl. No. 952,905
Claims priority, application Germany, Mar. 25, 1996, 196 11 682; Oct. 25, 1996, 196 44 357; Feb. 7, 1997, 297 02 083 U
Int. Cl.[7] F16L *41/08*
U.S. Cl. 285—136.1 **17 Claims**



1. A connecting pipe for a liquid-tight connection to a sewer pipe having a branch opening, said connecting pipe comprising:

a connecting-pipe body having at least two spaced apart circumferential sealing chambers,

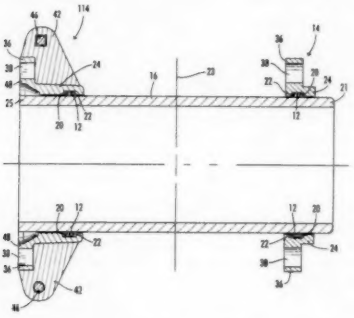
wherein one of the sealing chambers contains a first sealing element comprising a ring seal proximate an inside surface of the sewer pipe and facing an opening-wall surface of the branch opening, and wherein the ring seal comprises at least one sealing-lip ring extending over an outer contour of said one sealing chamber to contact said opening-wall surface of the branch opening, and

wherein another of said sealing chambers contains a second sealing element comprising a flexible filler proximate an outer surface of the sewer pipe and facing the opening-wall surface of the branch opening such that a slot chamber extending from said another sealing chamber to the opening-wall surface of the branch opening is scalingly bridged; and

a spacing ring having a bearing flange compatible with an outside pipe surface of said sewer pipe,

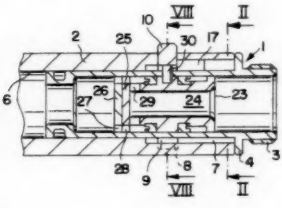
wherein the spacing ring is a positioning ring fastened to the connecting-pipe body by fastening means in such a manner that when the connecting-pipe body is inserted into the branch opening, the first and second sealing elements are positioned opposite the opening-wall surface of the branch opening.

6,015,170
COUPLING ASSEMBLY
Rollow M. Carpenter, 1040 Peninsula Dr., Gallatin, Tenn. 37066
Filed Nov. 26, 1997, Appl. No. 977,444
Int. Cl.[7] F16L *27/10*
U.S. Cl. 285—223 **8 Claims**



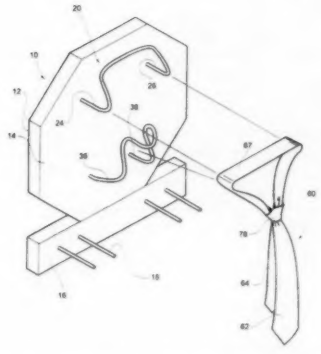
1. A coupling assembly for connecting components of a piping system, comprising:
a. a conduit;
b. at least one annular ring disposed about the conduit;
c. at least one gland having a circumferential groove formed along an inner surface for receiving the annular ring and means for attaching the gland to a mating component, wherein the gland further comprises a body and a flange portion extending radially from an end of the body; and
d. wherein the ring and the groove are configured to enable axial rotation and annular deflection of the gland.

6,015,171
RELEASABLE COUPLING MEANS FOR CONNECTING TWO TUBULAR ELEMENTS
Franz Schorn, Schiltach, Germany, assignor to Hans Grohe GmbH & Co. KG, Schiltach, Germany
Filed Sep. 12, 1997, Appl. No. 928,937
Claims priority, application Germany, Sep. 12, 1996, 196 37 074
Int. Cl.[7] F16L *17/00*
U.S. Cl. 285—362 **14 Claims**



1. A coupling means for connecting two tubular elements, comprising:
a nipple element couplable to one of the two tubular elements,
a bush element having an internal opening configured to receive the nipple element, the bush element being couplable respectively to the other tubular element,
a coupling element coupled to one of said nipple and bush elements, the nipple element being inserted into the bush element, the coupling element preventing uncoupling of the nipple and bush elements by cooperation with a coupling mating element at the other of said nipple element and bush elements, the coupling element being movable into a release position against an urging force, wherein the coupling element has a direction of actuation and latched position in which said coupling element can be further adjusted in the direction of actuation.

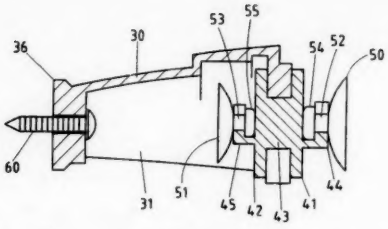
6,015,172
NECKTIE SUPPORT FOR TYING
Wayne Williams, and Robert Todd Williams, both of 2712 The Plaza, Charlotte, N.C. 28205
Filed May 20, 1997, Appl. No. 859,215
Int. Cl.[7] A41D *25/08*
U.S. Cl. 289—2 **10 Claims**



1. A device for supporting a necktie during tying to facilitate the formation of a useful and aesthetically pleasing knot so that a necktie having a knot formed on said device may be removed from said device and worn, said device comprising:
a base member extending generally vertically;
means for supporting a necktie including first and second support members mounted to and projecting outwardly from said base member with said first support member being spaced a predetermined distance away from said second support member, said first and second support members including first and second rods projecting generally perpendicularly outwardly from said base member in a generally parallel side-by-side relationship with said first and second rods including generally vertically extending portions projecting upwardly and terminating in respective distal ends and a generally horizontal curved member extending between and joined with said respective distal ends of said first and second rods; and
means for preventing necktie movement in a direction toward said first and second support members mounted to said base member at a vertical spacing below said first and second support members and defining a knot forming region thereat.

6,015,173
STRUCTURE OF DOOR GUARD
Chen Shui Shang, 199 Su Mau Road, Ho Mei Township, Chan Hua Hsien, Taiwan
Continuation-in-part of application No. 08/993,625, Dec. 18, 1997, abandoned. This application Feb. 8, 1999, Appl. No. 246,902.
Int. Cl.[7] E05C *19/18*
U.S. Cl. 292—288 **3 Claims**

1. A guard for a door comprising:
a connection body having a hollow trough formed at an underside thereof, said connection body having a front wall at one end thereof, said front wall having an inverted U-shaped trough formed centrally thereof, said connection body having a back wall at an opposite end thereof said back wall having a



through hole formed centrally thereof, said through hole opening to said hollow trough;

a fixed member having two block pieces connected together by a pillar, said pillar affixed centrally to each of said two block pieces, an interval between said two block pieces fitting into said inverted U-shaped trough in said front wall, each of said two block pieces having a protruding bracket extending from an outer surface thereof, a receiving trough being formed between said outer surface and said protruding bracket, said protruding bracket having a U-shaped trough formed therein, said U-shaped trough and said receiving trough having an opening facing upwardly;

two suction cups each formed with a connector member at one side thereof, said connector member having a stop ring connected thereto at an end opposite said one side, said stop ring having a diameter greater than said connector member, said connector member and said stop ring being received respectively into said U-shaped trough and said receiving trough of said fixed member, one of said two suction cups being positioned outwardly of said front wall, another of said two suction cups positioned within said hollow trough of said connection body;

a screw extending through said through hole of said back wall, said screw adapted to secure said connection body to a surface; and

a smooth flat pad positioned so as to face said one of said two suction cups, said pad being formed of a material selected from the group consisting of plastic and iron.

6,015,174

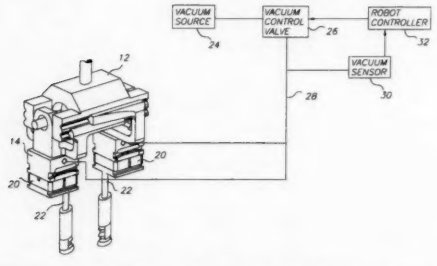
UNIVERSAL END EFFECTOR FOR ROBOTIC APPLICATIONS

Camiel J. Raes, Phelps; Joseph E. Stagnitto, Rochester, and James A. White, Conesus, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 4, 1998, Appl. No. 90,828

Int. Cl.[7] B25J *15/06;19/02*

U.S. Cl. 294—2 **11 Claims**



1. A parts acquisition tool for robotic tooling applications comprising:

(a) a first tubular finger;

(b) a second tubular finger, said first and second tubular fingers residing in a generally parallel relationship to one another, said first and second tubular fingers adapted to be moved toward and away from one another;

(c) a first bellows affixed to a distal end of said first tubular finger;

(d) a second bellows affixed to a distal end of said second tubular finger;

(e) a first pinch member extending from said first tubular finger laterally adjacent said first bellows; and

(f) a second pinch member extending from said second tubular finger laterally adjacent said second bellows, said first and second bellows extending below said first and second pinch members said first and second bellows at least partially compressing against said first and second pinch members when an object is grasped between said first and second bellows.

6,015,175

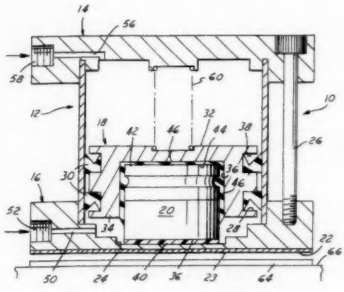
MAGNETIC HOLDING DEVICE

Cary Carruth, East China; Frederick A. Mondro, Harrison Township; John J. Peralta, Roseville; Robert Pelletier, Macomb, and Nickolas Kovacs, Garden City, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Nov. 5, 1997, Appl. No. 964,675

Int. Cl.[7] B66C *1/04*

U.S. Cl. 294—65.5 **15 Claims**



1. A magnetic holding device, comprising:

a hollow cylinder having opposed first and second end portions;

a piston slidably mounted within said cylinder;

a magnet carried by said piston;

a first end cap provided on said first end portion of said cylinder;

a second end cap provided on said second end portion of said cylinder;

a first fluid port communicating with said cylinder adjacent said first end portion of said cylinder for driving said piston toward said second end portion of said cylinder; and

a second fluid port communicating with said cylinder adjacent said second end portion of said cylinder for driving said piston toward said first end portion of said cylinder,

said magnet being adapted to pick up a workpiece adjacent said first end cap when said piston is driven toward said first end portion of said cylinder.

6,015,176

KIT FOR MOUNTING A PICKUP BOX ON A TRUCK FRAME

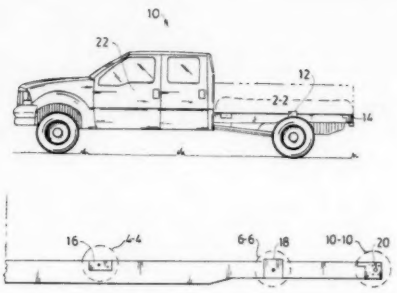
James E. Egan, 106 Steko Ave., Rochester, N.Y. 14615

Filed Mar. 22, 1999, Appl. No. 274,165

Int. Cl.[7] B62D *27/04*

U.S. Cl. 296—35.1 **8 Claims**

1. A kit for installing a pickup box onto the frame of a chassis cab, wherein said kit is comprised of a first bracket, a second bracket, a third bracket, a fourth bracket, a fifth bracket, and a sixth bracket, and wherein:



(a) each of said first bracket and said second bracket has a substantially rectangular shape, a front wall, a back wall, a top wall, a bottom wall, a left wall, a right wall, a thickness of at least about 0.8 inches, a length of from about 13.9 to about 14.2 inches, and a width of from about 5.9 to about 6.2 inches, wherein:

1. disposed between said front wall and said back wall, and extending from said top wall towards said bottom wall, is a downwardly extending first hole with a depth of at least about 0.9 inched, wherein the center of said first hole is disposed from about 0.38 to about 0.42 inches from said back wall,
2. extending through said front wall to said back wall is a second hole with a center which is disposed from 6.38 to about 6.42 inches from said left wall and about 2.01 to about 2.05 inches from said top wall,
3. extending from said front wall to said back wall is a third hole with a center which is disposed from about 12.98 to about 13.02 inches from said left wall and from about 3.69 to about 3.73 inches from said top wall,

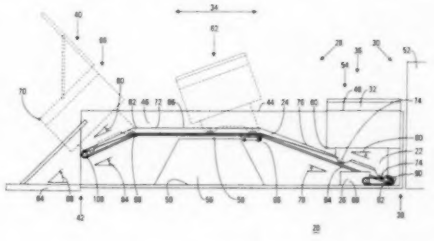
(b) each of said third bracket and said fourth bracket is substantially L-shaped and is comprised of a first leg integrally joined to a second leg, wherein:

1. said first leg has a front surface, a back surface, a a thickness of from about 0.355 to about 0.395 inches, a height of from about 5.98 to about 6.02 inches, and a width of from about 7.05 to about 7.45 inches, wherein a steel spacer is welded to said back surface of said first leg, wherein:
   (a) said steel spacer has a thickness of from about about 0.98 to about 1.02 inches, and
   (b) a hole is disposed through said steel spacer and said first leg, p**2** 2. said second leg has a top surface, a bottom surface, a thickness of from about 0.355 to about 0.395 inches, a length of form about 3.98 to about 4.02 inches, and a width of from about 7.05 to about 7.45 inches, wherein a steel spacing block is attached to said bottom surface of said second leg, wherein said steel spacing block has a thickness of from about 0.54 to about 0.59 inches, a width of from about 2.98 to about 3.02 inches, and a length of from about 7.05 to about 7.45 inches, and wherein a hole extends from said top surface of said second leg through said steel spacing block, and

(c) each of said fifth and sixth brackets is comprised of a left side, a right side, a top surface, a front surface, and a back surface, has a substantially rectangular shape, and is comprised of an offset leg extending from said left side thereof, wherein:

1. each of said fifth sixth brackets has an overall length of from 9.98 to about 10.02 inches, and overall width of from about 5.98 to about 6.02 inches, and a thickness of from about 0.98 to about 1.02 inches,
2. said offset leg has an length of from 3.98 to about 4.02 inches, a width of from about 1.98 to about 2.02 inches, and a thickness of from about 0.98 to about 1.02 inches,
3. a hole is disposed in said top surface and extends downwardly within said top surface for a distance of from about 0.98 to about 1.02 inches,
4. seven holes extend from said front surface of each of said fifth and sixth brackets to said back surface of each of said fifth and sixth brackets.

6,015,177
VEHICULAR STORAGE UNIT TRANSIT SYSTEM
Raul Tijerina, 4701 N. 487th Ave., Tonopah, Ariz. 85354
Filed Dec. 23, 1997, Appl. No. 997,497
Int. Cl.[7] **B60R** *5/00;7/00;* **B60N** *3/12*
U.S. Cl. 296—37.6 **19 Claims**



18. A vehicular storage unit transit system for a vehicle, said vehicle possessing a cargo area having a forward end, an access end opposing said forward end, a pair of opposing sidewalls, a floor, and a pair of wheelwells positioned between said sidewalls and protruding above said floor, said wheelwells having a highest point, said highest point being a point furthest removed from said floor, said transit system comprising:

a storage unit having a mounting plane and a lowest point, said lowest point being a point least removed from said floor;

a pair of guidance assemblies configured to be coupled to said sidewalls and to guide said storage unit during a transit thereof between a first position proximate said forward end of said cargo area and a second position proximate said access end of said cargo area, said transit passing through a third position, said lowest point of said storage unit being less removed from said floor than said highest point of said wheelwells when said storage unit is in said first position and said second position, and said lowest point of said storage unit being more removed from said floor than said highest point of said wheelwells when said storage unit is in said third position, each of said guidance assemblies comprising a first section configured to sustain said storage unit in a first attitude with said mounting plane substantially parallel to said floor when said storage unit is in said first position, a second section configured to sustain said storage unit in a second attitude with said mounting plane oblique to said floor when said storage unit is in said second position, and a third section coupling said first section to said second section and configured to guide said storage unit during said transit; and

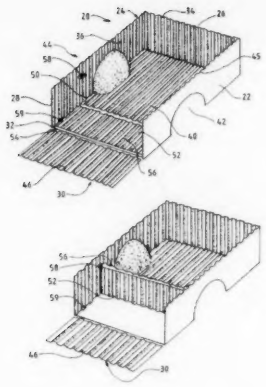
a pair of transit assemblies coupled to said guidance assemblies and configured to be coupled to said storage unit.

6,015,178
TRUCK BED LINER WITH HINGEDLY AFFIXED DIVIDER
Brian Haack, 2050 Haslett Rd., Haslett, Mich. 48840
Filed Jun. 6, 1997, Appl. No. 870,334
Int. Cl.[7] **B60R** *13/01*
U.S. Cl. 296—39.2 **19 Claims**

1. A truck bed liner of the type generally having a front wall, two side walls, a bottom, and a back wall which is an integral part of the liner or, alternatively, a separate piece affixed to a tailgate, the improvement comprising:

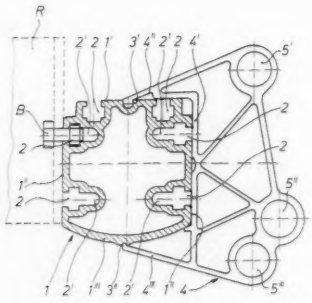
a divider hingedly affixed to the liner; and

divider securing means,



whereby, the integrated divider can be positioned and secured with the divider securing means to compartmentalize the truck bed.

6,015,179
DEVICE FOR MOUNTING A HYDRAULICALLY OPERATED TAILGATE ON A TRUCK
Walter Weber, Ovocna 4, 85110 Bratislava, Slovakia
PCT No. PCT/AT96/00158, § 371 Date Mar. 9, 1998, § 102(e) Date Mar. 9, 1998, PCT Pub. No. WO97/09197, PCT Pub. Date Mar. 13, 1997
PCT Filed Sep. 5, 1996, Appl. No. 29,927
Claims priority, application Austria, Sep. 7, 1995, 1487/95; Dec. 1, 1995, 1970/95
Int. Cl.[7] B62D *25/00*
U.S. Cl. 296—57.1 **1 Claim**



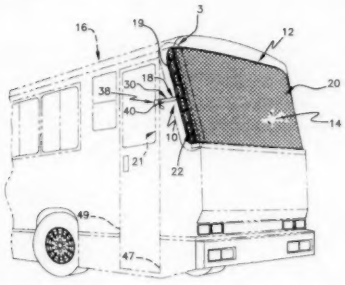
1. Device for mounting a hydraulically operated tailgate on a frame member of a truck, comprising:

a first extruded elongate hollow member of substantially quadrangular cross-section made of aluminum and having upper and lower surfaces respectively provided with first and second elongate grooves;

a second extruded elongate hollow member comprising a pair of parallel cantilever arms having end sections for securing in the first and second elongate grooves and plurality of bores for pivotally mounting first ends of tailgate lifting and pivoting apparatus; and

a third extruded elongate hollow member comprising means for securing the tailgate and a plurality of bores for pivotally mounting opposite ends of the tailgate lifting and pivoting apparatus.

6,015,180
ANCHOR SYSTEM FOR A SUN SCREEN ON A WINDSHIELD OF A MOTOR HOME
Guenther Beuerle, 3840 Graines Ct., Winterhaven, Fla. 33884
Filed Mar. 5, 1999, Appl. No. 263,199
Int. Cl.[7] B60J *1/20*
U.S. Cl. 296—95.1 **4 Claims**



1. An accessory for a motor home, the motor home having a windshield, a door, including a door frame, a window, including a window frame, the accessory comprising:

a flexible sun screen having opposite vertical edges, each said vertical edge bearing a plurality of snaps; and

securement means for securing each said vertical edge to the motor home, said securement means including

a pair of stiff, straight anchor bars, each of said stiff straight anchor bars including a series of spaced apart apertures, and each said anchor bar extending substantially along the length of one of s aid vertical edges

fastening pins for insertion through a plurality of said spaced apart apertures, leaving at least one of said spaced apart apertures unengaged, each of said fastening pins also extending through said flexible sun screen such that both of said stiff, straight anchor bars and a respective one of said vertical edges of said flexible sun screen are held in engagement with one another;

a pair of anchor straps having a first end including an eyelet and a second free end;

a pair of nuts and bolts, each said pair of nut and bolt being passing through said eyelet on said first end of each of said anchor straps, each said pair of nut and bolt also passing through said flexible sun screen and one of said unengaged spaced apart apertures in each of said stiff, straight anchor bars such that each of said first ends of said anchor straps is held in engagement with one of said stiff, straight anchor bars and its related vertical edge; and

a pair of hook plates, each said hook plate having an angled hook end and a pair of slots, each of said pair of slots being arranged to engage said second free end of each of one of said anchor straps and said each angled hook end is engageable with a side window frame of the motor home; whereby

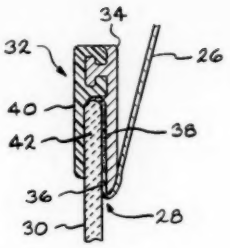
said flexible sun screen is held over the windshield of the motor home and may be engaged therewith by a person standing on the ground.

6,015,181
FLUSH FIT REMOVABLE BACKLIGHT
Anna L. Exner, 2564 Wealdstone, Toledo, Ohio 43617
Filed Nov. 12, 1997, Appl. No. 969,051
Int. Cl.[7] B60J *7/12*
U.S. Cl. 296—145 **16 Claims**

1. A flush fit, removable backlight assembly, comprising:

a backlight;

a frame member having a lower body portion and an upper body portion, said upper body portion including an elongate member disposed generally parallel to said upper body portion,



spaced therefrom by an intermediate member and having a cross bar forming a generally T-shaped portion and defining upper and lower channels; and

an elongate clamping member having a lower clamping portion and an upper locking portion, said upper locking portion including elongate, opposed members defining a region adapted to receive said elongate member of said upper body portion of said frame member,

wherein said elongate member of said upper body portion of said frame member interlocks with said elongate opposed members of said upper locking portion of said clamping member, said lower body portion of said frame member engages one side of the backlight and said lower clamping portion of said clamping member engages an opposite side of said backlight.

6,015,182

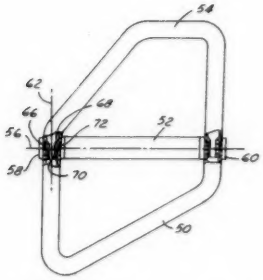
VEHICLE DOOR STRUCTURES INCORPORATING HYDROFORMED ELEMENTS AND PROCESSES FOR ASSEMBLING SUCH ELEMENTS

Ulrich Weissert, Rochester; Okan Goenueldinc, Birmingham; Marco Cercone, Troy; Ross Winslow, Royal Oak, all of Mich.; Andy Wolf, Parkland, Fla.; Robert Koehr, Harrison Township, Mich., and Rolf Heyll, Renningen, Germany, assignors to Porsche Engineering Services, Troy, Mich.

Provisional application No. 60/076,354, Feb. 27, 1998. This application Feb. 25, 1999, Appl. No. 257,029.

Int. Cl.[7] B60J *5/04;5/10*

U.S. Cl. 296—146.6 **38 Claims**



1. A vehicle door and window frame subassembly comprising:

a window frame defining first ends,

a door frame defining second ends, each of said first ends received within one of said second ends, and

a reinforcement member defining third ends, said third ends forming receptacles within which the first and second ends are received,

said first, second and third ends being press-fit together by pressurized fluid to join the frames and the reinforcement member together to form the door and window frame subassembly.

6,015,183

CENTER TUNNEL FOR A MOTOR VEHICLE AND METHOD OF MAKING SAME

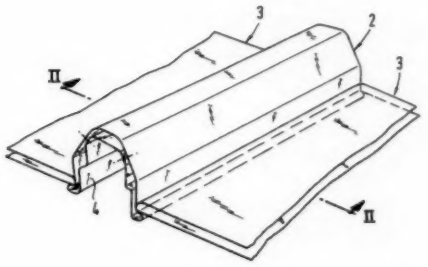
Josip Vlahovic, Bietigheim-Bissingen, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed Jul. 8, 1997, Appl. No. 893,545

Claims priority, application Germany, Jul. 30, 1996, 196 30 645

Int. Cl.[7] B62D *25/20*

U.S. Cl. 296—204 **14 Claims**



1. Center tunnel for a vehicle, especially a motor vehicle, with the center tunnel, that has a shape that is open at the bottom, having lengthwise sections in the form of hollow members, at least areawise, wherein the center tunnel, viewed in cross section, is formed by a double-walled hollow body produced by the internal high-pressure shaping method, with spaced wall sections of the hollow body being brought together areawise.

6,015,184

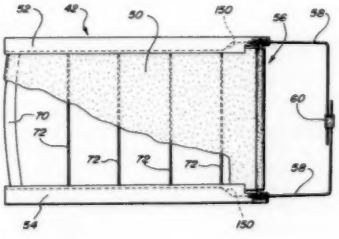
SUNSHADE FOR AN AUTOMOTIVE VEHICLE ROOF

Kip A. Ewing, Dearborn, and Richard D. George, Riverview, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Continuation of application No. PCT/US94/07717, Jul. 5, 1994. This application Jan. 6, 1997, Appl. No. 779,922.

Int. Cl.[7] B60J *7/06*

U.S. Cl. 296—219 **40 Claims**



1. A sunshade for retractably and substantially covering a roof of an automotive vehicle, said sunshade comprising:

a plurality of roof bows slidable proximate to an inside surface of said roof;

said plurality of bows movable from a stowed position wherein at least one of said plurality of bows is straight, to a functional position wherein said at least one of said plurality of bows is curved in at least one plane; and

a leading bow curved in a substantially horizontal manner when in said functional position;

a first track having a channel extending in a fore and aft direction; and

a second track having a channel extending in a fore and aft direction;

each of said plurality of bows having ends positionable within said channels for slidable movement;

said channels of said tracks being angled in relation to one another so as to cause said at least one of said plurality of bows to straighten and curve when moving from said stowed position to said functional position.

6,015,185

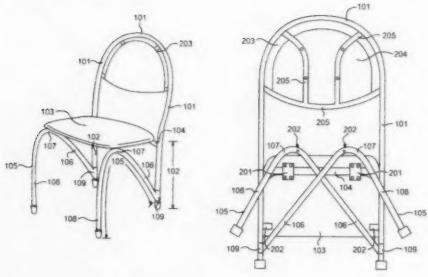
GATE-FOLD CHAIR

Steven A. Buono, Greeneville, Tenn., assignor to Meco Corporation, Greeneville, Tenn.

Filed Mar. 11, 1999, Appl. No. 266,523

Int. Cl.[7] A47C *4/00*

U.S. Cl. 297—59 **9 Claims**



1. A folding chair comprising:

a back member having two rear legs;

a seat having an underside;

a seat rod extending between and affixed to the two rear legs;

a rotatable connector for connecting the seat to the seat rod;

a pair of side legs each comprising a rear portion extending upwardly from a lower portion of the rear leg at an acute angle, a curved portion for abutting the seat and connecting the rear portion to a forward portion of the side leg, the forward portion extending downwardly and forwardly from the curved portion at an acute angle; and a pivotable connector for connecting the side legs to the back member at the lower portion of the rear leg, the pivotable connector adapted to allow the side legs to be placed in a position substantially coplanar to the back member.

6,015,186

FOLDING BENCH SEAT

Andreas Grieger, Kressbronn, Germany, assignor to Aguti Produktenwicklung & Design GmbH, Kressbronn, Germany

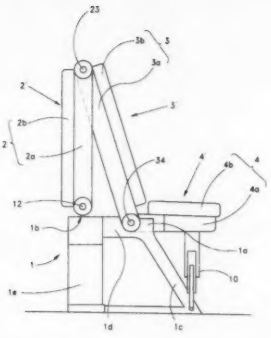
PCT No. PCT/EP96/05239, § 371 Date Jul. 27, 1998, § 102(e) Date Jul. 27, 1998, PCT Pub. No. WO97/19830, PCT Pub. Date Jun. 5, 1997

PCT Filed Nov. 27, 1996, Appl. No. 77,493

Claims priority, application Germany, Nov. 27, 1995, 195 44 014

Int. Cl.[7] B60N *2/34*

U.S. Cl. 297—67 **21 Claims**



1. A folding bench seat for vehicles comprising a seat frame having a base frame configured to be attached to a floor area of a vehicle, and a top structure secured to the base frame, the top structure comprising:

an upright column unit mounted by a lower, horizontally aligned pivot joint to the base frame, and being foldable between an upright position and a reclining, generally horizontal position;

a back unit mounted by an upper, horizontally aligned pivot joint to the column unit so that the back unit extends from the upper, horizontally aligned pivot joint to form a triangular structure with the column unit and the base frame when the column unit is in the upright position;

a seat unit connected to the back unit, with the back unit being releasably connected to the base frame; and

a three-point restraint system attached to the column unit at an upper turning point.

6,015,187

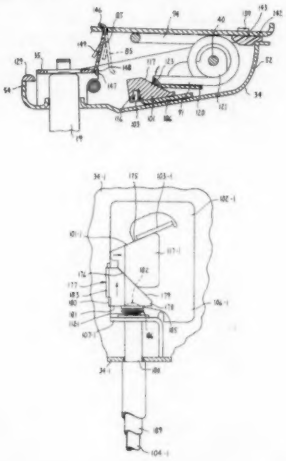
TILT CONTROL FOR CHAIR

Richard N. Roslund, Jr., Jenison; Patrick Nelson, Holland; Larry Allen Wilkerson, Comstock Park; Troy Roark, West Olive, all of Mich.; Joel Dral, Lula, Ga.; Steve Simpson, Holland, Mich., and John Clark, Holland, Mich., assignors to Haworth, Inc., Holland, Mich.

Continuation-in-part of application No. 08/846,618, Apr. 30, 1997, Pat. No. 5,909,924. This application Jan. 30, 1998, Appl. No. 16,371.

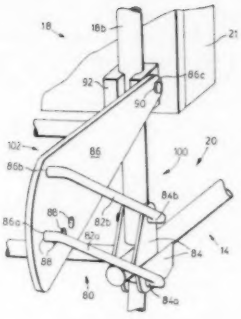
Int. Cl.[7] A47C *1/024*

U.S. Cl. 297—300.4 **26 Claims**



1. In a chair having a base, a seat assembly and a tilt control mechanism which is supported on said base and permits rearward tilting of said seat assembly, said tilt control mechanism including first and second members wherein one of said first and second members is movable relative to the other of said first and second members during rearward tilting of said seat assembly, said tilt control mechanism further including a biasing arrangement which defines a biasing force that resists relative movement between said first and second members to resist rearward tilting of said seat assembly, and an adjustment mechanism for adjusting said biasing force, comprising the improvement wherein said adjustment

mechanism includes a pair of angled guide surfaces which are laterally spaced apart in opposing relation and converge in a direction extending away from said biasing arrangement, said adjustment mechanism further including an actuator and a first block which is movable toward and away from said biasing arrangement along a first path to adjust said biasing arrangement during movement of said first block, said first block including opposite first and second side surfaces which face in opposite sideward directions and converge toward each other, said first and second side surfaces being in slidable contact with said angled guide surfaces respectively and one of said angled guide surfaces being movable sidewardly by said actuator toward said first block along a second path to press said first block between said angled guide surfaces to effect movement of said first block along said first path.



6,015,188

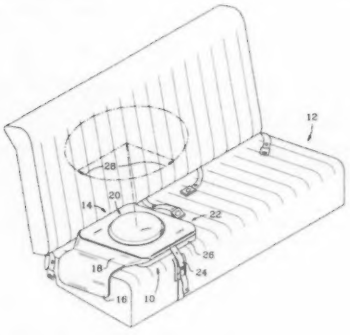
SWIVEL SEAT FOR A VEHICLE

Nellie K. Yundt, 10556 Southerland Dr., and Dan KinKaid, 12080 Florida St., both of Boise, Id. 83709

Filed Feb. 10, 1999, Appl. No. 248,248

Int. Cl.[7] **A47E** *1/02*

U.S. Cl. 297—344.21 **8 Claims**



1. A swivel seat for a vehicle, comprising a rotatable seating platform and a curved lip having a smooth planar upper surface disposed along the seating platform and extending away from the seating platform to a curved portion configured to curve down over an edge of a vehicle seat when the swivel seat is installed in the vehicle.

6,015,189

ADJUSTABLE CHAIR

Douglas Broadhead, Scarborough; Richard Eakins; Czeslaw Cimachowski, both of Toronto; Brian Bentley, Pickering; Joe Krommenhoek, Toronto; Son Ma, Scarborough; David Harding, and Nelson Pang, both of Toronto, all of Canada, assignors to Genus Medical Inc., Canada

Continuation-in-part of application No. 07/788,258, Nov. 5, 1991, Pat. No. 5,320,412. This application Jun. 13, 1994, Appl. No. 258,854.

Int. Cl.[7] **A47C** *1/024*

U.S. Cl. 297—353 **16 Claims**

1. A link assembly for use in a chair having a back frame that reclines relative to a seat frame, said chair including a back support that is mounted to said back frame for linear displacement relative thereto, said assembly comprising:

a frame link apparatus having a first member and a second member, said members being adapted to be connected at first and second pivot points respectively to the seat frame;

a back support link apparatus that is adapted to be connected at a third pivot point to the displaceable back support;

said first member and said second member connecting at fourth and fifth pivot points respectively to said back support link apparatus to facilitate linear displacement of said back support according to radial movement of said back frame relative to said seat frame; and

adjustment means located on at least one of said link apparati for selectively adjusting the distance from one of said fourth or fifth pivot points to one of said first, second or third pivot points, said adjustment means facilitating adjustment of the extent of linear displacement of said back support relative to said movement of said back frame.

6,015,190

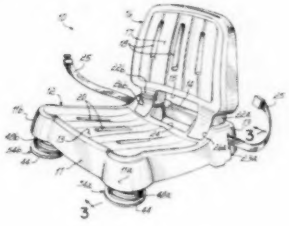
FOLDING HUNTING SEAT

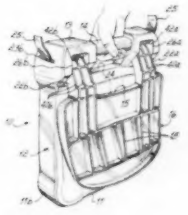
Charles Albert Wend, 1292 Northbend Rd., Hebron, Ky. 41048

Filed Nov. 12, 1998, Appl. No. 190,510

Int. Cl.[7] **A47C** *4/00*; **A47D** *1/02*

U.S. Cl. 297—378.1 **22 Claims**





10. A foldable chair, comprising:

a seat bottom having a seat bottom contoured surface having an interior and a rearward area including an aperture, the aperture including a pair of radially opposed abutting stop surfaces; and

a seat back having a seat back contoured surface, the seat back having at least one bracket extending from the seat back and received within the aperture, the bracket being pivotally connected to the seat bottom for rotation about a pivot axis, the pivot axis laterally bisecting the rearward area and the aper-

ture, the seat back being pivotable between an upright position and a folded position, the bracket projecting through the aperture and being received within the interior of the seat bottom when the seat back is rotated into the upright position, the bracket having a pair of radially opposed pivot stop surfaces that contact the pair of radially opposed abutting stop surfaces respectively when the seat back is rotated into the upright position.

6,015,191

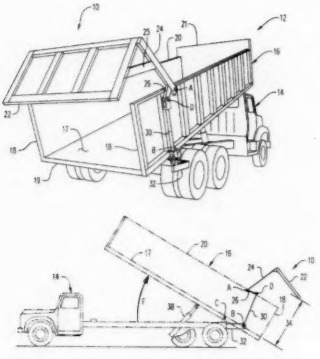
TAILGATE APPARATUS

Ernest R. Bontrager, 4125 Prescott St., Sarasota, Fla. 34232

Filed May 8, 1998, Appl. No. 75,048

Int. Cl.[7] B60P *1/04*

U.S. Cl. 298—23 D **4 Claims**



1. A tailgate apparatus pivotally connected to a dump truck for automatically opening and closing a tailgate mounted at the rear of a tiltable truck bed of the dump truck, the truck bed having a vertical front wall and vertical side walls, said tailgate disposed adjacent ends of the side walls and a bottom of the truck bed when the truck bed is in a horizontal position, the truck bed tiltable about a first transverse axis attached to a chassis of the dump truck, said first axis positioned forwardly of the end of the bottom and in proximity to, the bottom, the apparatus comprising:

a pair of elongated, spaced apart substantially parallel gate arms each pivotally connected at a forward end thereof to a corresponding said side wall about a second substantially transverse axis positioned forwardly of the ends of the side walls and generally above said first axis;

said tailgate rigidly connected at each side margin thereof generally orthogonally to a corresponding rearward end of each said gate arm;

an elongated substantially upright, rigid pivot rod pivotally connected at a lower end thereof to the chassis about a third substantially transverse axis positioned between the end of the bottom and said first axis, an upper end of said pivot rod pivotally connected to one said gate arm about a fourth substantially transverse axis positioned below said second axis;

said axes being so arranged such that said tailgate arcuately opens in substantially direct proportion to the angular tilting movement of the truck bed about said first axis.

6,015,192

SYSTEM FOR ESTIMATING VEHICLE BODY SPEED AND ROAD SURFACE FRICTION COEFFICIENT

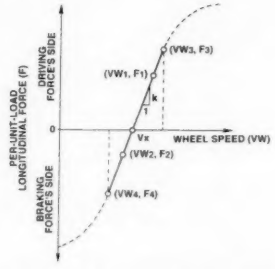
Tomohiro Fukumura, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 30, 1997, Appl. No. 886,143

Claims priority, application Japan, Jul. 18, 1996, 8-189399

Int. Cl.[7] B60T *8/24*

U.S. Cl. 303—140 **23 Claims**



1. A system for estimating a vehicle operating variable of a vehicle provided with a set of road wheels, the system comprising:

a sensor group for sensing vehicle operating conditions of the vehicle to determine values of wheel speed, wheel load and wheel longitudinal force of each wheel of at least two of the road wheels; and

an estimating unit for determining a relationship among the wheel speed, wheel load and wheel longitudinal force in accordance with the values of the wheel speed, load and longitudinal force and for estimating the vehicle operating variable from the relationship, the vehicle operating variable being one of a body speed and a road surface friction coefficient;

wherein the estimating unit is configured to determine a value of a per-unit-load longitudinal force by dividing the value of the wheel longitudinal force by the value of the wheel load for each wheel, to form a data pair of the values of the per-unit-load longitudinal force and wheel speed of each of said at least two of the road wheels, to identify a regression line from a plurality of the data pairs, and to estimate the vehicle operating variable from the regression line.

6,015,193

BRAKING AND STEERING SYSTEM FOR A VEHICLE

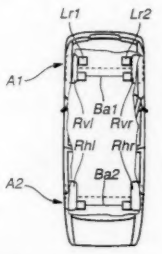
Thomas Vogel, Leonberg, and Thomas Thurner, Kirchheim/Teck, both of Germany, assignors to DaimlerChrysler AG, Germany

Filed Jul. 18, 1996, Appl. No. 683,250

Claims priority, application Germany, Jul. 18, 1995, 195 26 250

Int. Cl.[7] B62D *6/00*

U.S. Cl. 303—147 **27 Claims**



1. Braking and steering system for a vehicle having at least two axles, a braking function being performed for each wheel on each

axle, and a steering function being performed on at least one axle, said braking and steering system comprising:

at least one fault-tolerant computing unit for determining a desired braking effect for each wheel of said vehicle, and a desired steering effect for each wheel having a steering function, in each case in response to sensor signals;

at least one braking adjuster, including a service brake for controlling said braking function in response to a desired braking effect and a desired steering effect determined by said computing unit;

at least one steering adjuster for controlling said steering function in response to a desired steering effect and a desired braking effect determined by said computing unit;

a fault-tolerant communication device, connecting said adjusters to said computing unit and a fault-tolerant energy supply for the adjusters and the computing unit (**3**).

6,015,194

METHOD AND ARRANGEMENT FOR CONTROLLING A BRAKING SYSTEM OF A VEHICLE

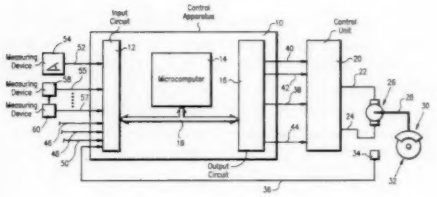
Heinz Decker, Vaihingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 30, 1997, Appl. No. 941,047

Claims priority, application Germany, Oct. 1, 1996, 196 40 533; Nov. 21, 1996, 196 48 195

Int. Cl.[7] **B60T** *13/66*

U.S. Cl. 303—155 **14 Claims**



1. A method for controlling a brake system of a motor vehicle driven by an operator, the brake system including at least one wheel brake apparatus including an actuable brake actuator, the method comprising the steps of:

actuating said brake actuator in the context of a closed-loop control in dependence upon a desired value pregiven by the operator; and,

switching from said closed-loop control to an open-loop control of said brake actuator in at least one operating region of said vehicle in dependence upon said desired value.

6,015,195

ENHANCED COVER ARRANGEMENT FOR A COMPUTER

Neil A. Anderson, Rochester; Mark L. Kyllo, Kasson, and Dano B. Lange, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 10, 1997, Appl. No. 949,141

Int. Cl.[7] **A47B** *81/00*

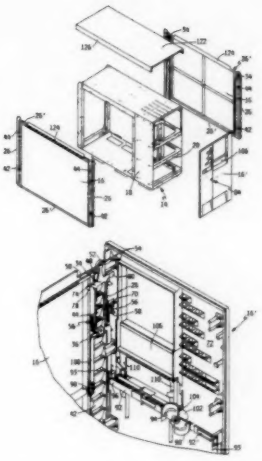
U.S. Cl. 312—223.2 **20 Claims**

1. A cover, comprising:

a panel having an opening therethrough, said panel including a fixed louver extending in alignment with the opening;

a sliding member connected to said panel and being slidable to an open position in which the opening is at least partially uncovered, and being slidable to a closed position in which the opening is fully closed, said sliding member including a sliding louver located within the opening and in alignment with said fixed louver, wherein said sliding louver and said fixed louver allow cooling air to pass through the panel and have the appearance of one continuous louver, when said sliding member is in the closed position; and

a mounting tab connected to said panel and being arranged to be accessible through the opening only when said sliding member is in the open position.



6,015,196

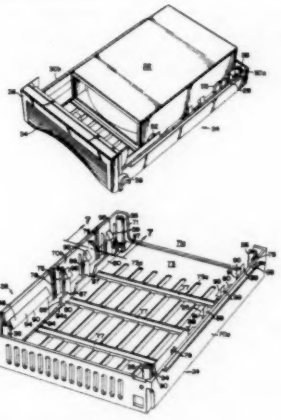
MODULE MOUNTING SYSTEM

Randall Scott Welch, Mission Viejo, and Richard Obermeyer, Tustin, both of Calif., assignors to Pacific Micro Data, Inc., Irvine, Calif.

Filed Mar. 26, 1998, Appl. No. 48,720

Int. Cl.[7] **A47B** *81/00;* **H05K** *7/00*

U.S. Cl. 312—223.2 **41 Claims**



40. A shuttle apparatus, comprising:

a module having a plurality of guides attached to the module, the guides being made of a shock absorbing material; and

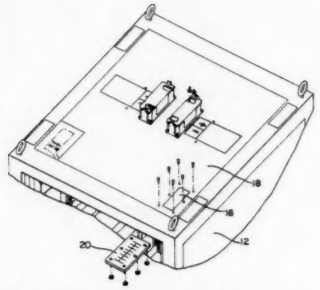
a first member including a floor, a longitudinal track disposed on said floor and a latch member disposed along the longitudinal track and extended upwardly from said floor to releasably receive and retain the guides, the longitudinal track having a reduced portion and a well, the guides being transversely, slidably receivable and retainable in-between the reduced portion and the latch member.

6,015,197

PROTECTIVE GROMMET APPARATUS AND METHOD

Joseph DiGiacomo, Burbank; Daniel J. Lecinski; Kenneth S. Laughlin, both of Arlington Heights, and Susan I. English, Chicago, all of Ill., assignors to 3Com Corp., Rolling Meadows, Ill.

Filed Feb. 28, 1998, Appl. No. 32,686
Int. Cl.[7] A47B *67/00*
U.S. Cl. 312—223.6 **11 Claims**



1. A protective grommet apparatus for covering an opening in a cabinet for housing electronic devices comprising:

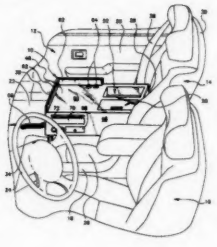
a flexible grommet for covering the opening in the cabinet, a plurality of slits formed in the grommet, the plurality of slits including one longitudinally oriented slit and a plurality of transversely oriented slits, the transversely oriented slits intersecting the longitudinally oriented slit, the transversely oriented slits oriented substantially perpendicular to the longitudinally oriented slit, the plurality of slits defining a plurality of flexible tab portions arranged in two rows to allow one or more cables to pass through the grommet.

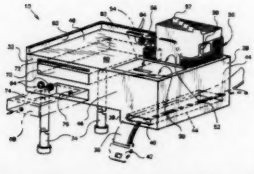
6,015,198

IN-CAR WORK STATION

Gary A. Stair, 751 Malena, Ann Arbor, Mich. 48103

Continuation of application No. 08/438,996, May 11, 1996, abandoned. This application Aug. 15, 1997, Appl. No. 912,077.
Int. Cl.[7] A47B *83/00*
U.S. Cl. 312—235.1 **9 Claims**





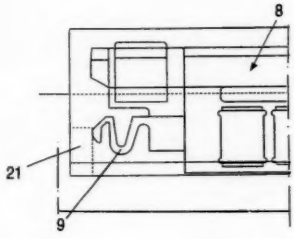
1. A work station for use in an automobile, said work station comprising: a base adapted to be supported on an automobile front passenger seat readily enabling use by an occupant of the automobile from a driver seat, said base including a rear end, a front end, an inboard side, an outboard side and a top surface, said rear end being positionable toward a rear portion of the seat and said front end being positionable toward a front portion of the seat, said top surface including an immovable planar portion located adiacent to said front end of said base, said planar portion operating as support surface for articles being used by the occupant of the driver seat, at least one drawer located in said base and being laterally extendable from a stored position within said base to an inboard use position where said drawer is substantially outside of said base, said drawer including a receptacle cavity adapted for storing articles therein, said cavity being accessible when said drawer is in said use position and being inaccessible when said drawer is in said stored position, and support means located within said drawer for receiving a note pad thereon and readily permitting access from the driver seat to said note pad supported thereon, said support means including a removable tray located in said receptacle cavity, said tray capable of being maintained in an inclined position.

6,015,199

GUIDE RAIL ASSEMBLY FOR DRAWERS

Emanuel Netzer, Höchst, and Günter Öhy, Hohenems, both of Austria, assignors to Julius Blum Gesellschaft M.B.H., Höchst, Austria

Filed Apr. 1, 1998, Appl. No. 53,085
Claims priority, application Austria, Apr. 1, 1997, 544/97
Int. Cl.[7] A47B *88/00*
U.S. Cl. 312—334.8 **14 Claims**



1. A guide rail assembly for use on each of opposite sides of a drawer to guide movement of the drawer into and out of an article of furniture, said assembly comprising:

a supporting rail to be mounted to a furniture side wall;

a pull out rail to be attached to the drawer;

at least one carriage situated between said supporting rail and said pull out rail;

said pull out rail and said supporting rail each having at least one stop for limiting movement of said pull out rail and said carriage with respect to said supporting rail;

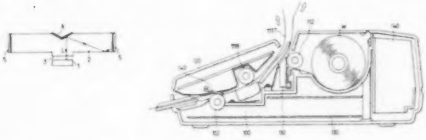
said at least one carriage having at least one buffer to abut one of said stops, said at least one buffer being in the form of a serpentine-shaped protrusion; and

said at least one carriage and said at least one buffer thereof being of unitary and one-piece construction of plastic material.

6,015,200
LIGHT CONDUCTIVE MEMBER, ILLUMINATING DEVICE HAVING THE SAME, AND INFORMATION PROCESSING APPARATUS HAVING THE ILLUMINATING DEVICE

Makoto Ogura, Isehara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1996, Appl. No. 617,634
Claims priority, application Japan, Mar. 22, 1995, 7-062601; Mar. 13, 1996, 8-055881
Int. Cl.[7] B41J *2/05;* **H04N** *1/04*
U.S. Cl. 347—3 **46 Claims**

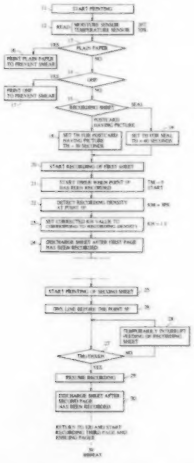


1. A light conductive member comprising a light entrance face in a part of a lateral face other than an end in the longitudinal direction of a rod-shaped translucent member; an area on a side opposed to said light entrance face, for reflecting and/or diffusing an entering light beam into the longitudinal direction of said rod-shaped translucent member; and an exit face in at least a part of a lateral face, for emitting at least a part of said reflected and/or diffused light beam.

6,015,201
INK JET RECORDING APPARATUS FOR PREVENTING SMEARING OF IMAGES

Osamu Asakura, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1995, Appl. No. 542,788
Claims priority, application Japan, Oct. 18, 1994, 6-252170
Int. Cl.[7] B41J *29/38;29/393;2/01*
U.S. Cl. 347—19 **32 Claims**



1. A recording apparatus for recording an image on a recording medium by discharging an ink droplet in accordance with information to be recorded and discharging the recorded recording medium to a predetermined position, said recording apparatus comprising:

discrimination means for discriminating a type of the recording medium, wherein a recording surface and a non-recording surface of one type of the recording medium are formed of different materials;

setting means for setting a predetermined time in accordance with the type of the recording medium discriminated by said discrimination means in which to prevent contact between the non-recording or recording surface of a recorded recording medium and the recording or non-recording surface of a discharged recording medium, said setting means comprises memory means which stores data relating to the predetermined time in accordance with the type of the recording medium, reads corresponding data from said memory means in accordance with the type of the recording medium which is discriminated by said discrimination means and sets the predetermined time in accordance with read data; and

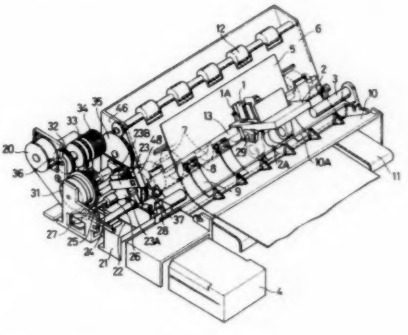
control means for controlling one of an operation of recording the recording medium and an operation of discharging the recording medium in order to prevent contact between the surface of the recorded recording medium and the discharged recording medium for the predetermined time set by said setting means,

wherein the predetermined time is set to be longer than a time limit which is necessary to prevent adhesion between the surface of the recorded recording medium and the discharged recording medium, and the time limit is longer than a time period necessary to absorb the ink discharged on the recording surface of the recording medium.

6,015,202
RECORDING APPARATUS

Soichi Hiramatsu, Yokohama, and Takao Aichi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 07/761,297, Sep. 17, 1991, abandoned. This application Aug. 23, 1993, Appl. No. 110,762.
Claims priority, application Japan, Sep. 21, 1990, 2-250282; Sep. 21, 1990, 2-250283; Sep. 21, 1990, 2-250284; Sep. 21, 1990, 2-250285
Int. Cl.[7] B41J *2/165*
U.S. Cl. 347—32 **26 Claims**



1. A recording apparatus comprising:

a carriage for reciprocally moving a recording head along a recording medium;

a driving power source for generating a first driving force;

a plurality of first transmission means for being driven by the first driving force generated by said driving power source;

second transmission means for engaging said driving power source and for releasably engaging one of said plurality of first transmission means, said second transmission means being moved by and corresponding to a position of said carriage and transmitting the first driving force from said driving power source to said plurality of first transmitting means;

first control means for controlling switching of said second transmission means between two adjacent transmission means among said plurality of first transmission means in accordance with one of a plurality of predetermined sequences, each

sequence having a plurality of operations, at least two of said operations overlapping in result;

second control means for controlling switching of said second transmission means between two transmission means among said plurality of first transmission means which are not adjacent to each other in accordance with a combination of the plurality of predetermined sequences, of which an overlapped operation or operations are skipped;

means for detecting whether said second transmission means has reached or not a predetermined position in a switching operation of said second transmission means from engaging one of said first transmission means to engaging another of said first transmission means;

means for causing repetition of said switching operation when said second transmission means is not located at said predetermined position;

a step motor for outputting a second driving force and reciprocally moving said carriage along a recording medium with the second driving force, said step motor being drivable in accordance with switching of an exciting phase;

a first sensor detecting an angular position of said step motor;

a second sensor detecting a position of said carriage in response to an output signal from said first sensor;

means for driving said step motor by switching of the exciting phase according to predetermined exciting timings;

carriage control means for controlling the movement of said carriage with the second driving force of said step motor driven by said driving means and a position of said carriage detected by said second sensor;

third control means for controlling said second transmission means to be released from engagement with one of said plurality of first transmission means and then to return to engagement with said one of said plurality of first transmission means;

means for adjusting an engaging condition of said second transmission means upon said second transmission means being released from engagement with said one of said plurality of first transmission means and then returning to engagement with said one of said plurality of first transmission means, so that said second transmission means is engaged with said one of said plurality of first transmission means in a same engaging condition as that before said second transmission means is released from said one of said plurality of first transmission means;

a third sensor moving with said carriage; and

a member to be detected by said third sensor, said member being disposed in a reciprocating path of said carriage and having an output used for a plurality of decisions.

6,015,203

RUBBING MEMBER FOR INK JET APPARATUS

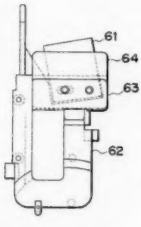
Atsushi Arai, Kawasaki, and Hideo Fukazawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1993, Appl. No. 5,064

Claims priority, application Japan, Jan. 20, 1992, 4-007551

Int. Cl.[7] B41J *2/165*

U.S. Cl. 347—33 **11 Claims**



1. An ink jet recording apparatus for use with an ink jet head having an array of a plurality of ink discharge ports defined by an ink discharge port surface, said apparatus comprising:

a rubbing member for rubbing said ink discharge port surface, said rubbing member having a rubbing edge provided substantially parallel to said array, said rubbing edge having an upper portion and a lower portion, wherein overlap of said upper portion of said rubbing edge onto said ink discharge port surface is greater than overlap of said lower portion of said rubbing edge on said ink discharge port surface.

6,015,204

METHOD FOR SENSING CARRIAGE POSITION SEPARATION AND COMPENSATING CARRIAGE POSITION OF AN INKJET PRINTER

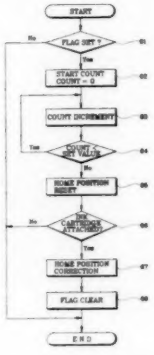
Jong-ho Ha, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Dec. 10, 1996, Appl. No. 763,124

Claims priority, application Rep. of Korea, Dec. 12, 1995, 95-48519

Int. Cl.[7] B41J *23/00*

U.S. Cl. 347—37 **1 Claim**



1. A method for sensing a separation of a carriage of a printer from a home position and moving the carriage, the method comprising steps of sensing and compensating, wherein:

the step of sensing includes a substep of checking whether the printer is in a stop state and whether a value storing the carriage position indicates the home position;

the step of sensing further includes a substep of determining whether a photo sensor indicates that the carriage is in the home position;

the step of sensing further includes a substep of setting a flag when (1) the substep of checking indicates that the printer is in the stop state and the value storing the carriage position indicates the home position, and (2) the substep of determining indicates that the carriage is not in the home position;

the step of compensating includes a substep of checking whether the flag has been set;

the step of compensating further includes a substep of maintaining a separation state of the carriage from the home position for a predetermined time when the flag has been set;

the step of compensating further includes a substep of resetting the value storing the carriage position after the predetermined time;

the step of compensating further includes a substep of testing whether an ink cartridge is attached to the carriage;

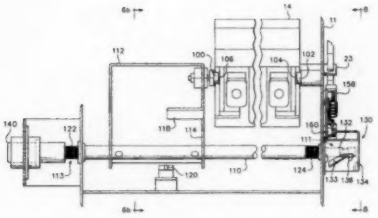
the step of compensating further includes a substep of moving the carriage to the home position when the ink cartridge is attached; and

the step of compensating further includes a substep of clearing the flag.

6,015,205
PRINT HEAD RESTRAINT MECHANISM

Richard G. Chambers, Portland, Oreg., and Kenichi Naruki, Hiroshima, Japan, assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Sep. 25, 1997, Appl. No. 937,424
Int. Cl.[7] B41J *25/308*
U.S. Cl. 347—37 **19 Claims**



1. A print head restraint mechanism for restraining a print head during transport, the print head forming part of a printing apparatus for ejecting ink at an image-receiving medium, the printing apparatus including at least one side plate, the print head being spaced apart a distance from the image-receiving medium and moveable in a travel path parallel to the image-receiving medium, the print head restraint mechanism comprising:

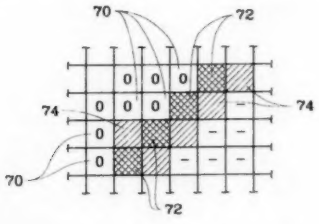
an engaging apparatus that engages with and disengages from the print head to limit movement of the print head, the engaging apparatus being positioned away from and in a non-interfering relationship with the travel path of the print head during printing; and

an engaging mechanism for moving the engaging apparatus into and out of engagement with the print head when the print head is positioned in a restraint position, the engaging mechanism connected to the side plate of the printing apparatus.

6,015,206
BLEED AVOIDING, COLOR INK JET PRINTING

Scott Michael Heydinger, and James Knox Howes, III, both of Lexington, Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Nov. 21, 1995, Appl. No. 560,765
Int. Cl.[7] B41J *2/21*
U.S. Cl. 347—43 **20 Claims**



20. An imaging apparatus capable of forming an image on a substrate, comprising:

a) means for receiving a representation of an image defined according to a plurality of locations in the image, selected ones of the locations in the image each being one of a plurality of colors, the plurality of colors being black and at least one color other than black;

b) means for providing a substrate having a plurality of locations thereon, the plurality of locations on the substrate generally corresponding to the plurality of locations in the image, and the plurality of locations on the substrate being generally aligned in columns and rows;

c) means for identifying color boundary locations, the color boundary locations being the locations on the substrate corresponding to the locations in the image which are one of the at least one color other than black and contiguous to one of the locations in the image which is the color black;

d) means for identifying a black boundary for each of the color boundary locations, each of the black boundaries including a column boundary and a row boundary,

i) each of the column boundaries including at least two contiguous ones of the locations on the substrate, each of said at least two contiguous ones of the locations on the substrate included in the respective column boundary corresponding to one of the locations in the image which is the color black and being aligned in one of the columns with the respective color boundary location, and one of said at least two contiguous locations on the substrate included in the respective column boundary being contiguous to the respective color boundary location; and

ii) each of the row boundaries including at least two contiguous ones of the locations on the substrate, each of said at least two contiguous ones of the locations on the substrate included in the respective row boundary corresponding to one of the locations in the image which is the color black and being aligned in one of the rows with the respective color boundary location, and one of said at least two contiguous locations on the substrate included in the respective row boundary being contiguous to the respective color boundary location;

e) means for delivering at least one ink to each of the locations on the substrate corresponding to one of the locations in the image which is one of the plurality of colors, the respective at least one ink being capable of generally forming the color of the respective corresponding location in the image on the substrate, the ink being delivered to the locations on the substrate corresponding to the black boundaries including ink having the color black and a plurality of inks that combine to form process black on the substrate, and being delivered in an alternating pattern, wherein the locations on the substrate corresponding to the black boundaries to which the black ink is delivered are diagonally arranged with respect to the columns and rows in black ink diagonal arrangements, and wherein the locations on the substrate corresponding to the black boundaries to which said plurality of inks that combine to form process black are delivered are diagonally arranged with respect to the columns and rows in process black diagonal arrangements, the black ink and process black diagonal arrangements across adjacent columns and rows being mutually exclusive; and

f) means for generally receiving the respective at least one ink on each of the locations on the substrate corresponding to one of the locations in the image which is one of the plurality of colors, wherein said locations on the substrate which have generally received one of the respective at least one ink combine to form the image on the substrate.

6,015,207
COLOR HALFTONING OPTIONS INFLUENCED BY PRINT-MODE SETTING

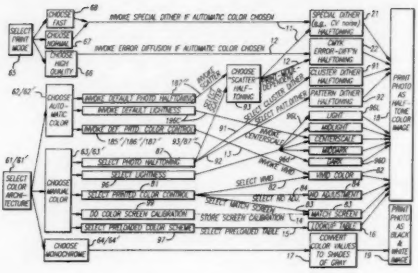
Kirt Alan Winter, Escondido, and Thomas G. Smith, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of application No. 08/759,399, Dec. 4, 1996. This application Jan. 21, 1999, Appl. No. 235,006.
Int. Cl.[7] B41J *2/21;29/393;* **H04N** *1/46*
U.S. Cl. 347—43 **13 Claims**

1. A method of controlling print quality comprising:

defining a screen color gamut indicative of all the visible colors in a monitor image, said screen color gamut falling within a predefined color gamut inclusive of all visible colors;

defining a printer color gamut within said predefined color gamut, said printer color gamut and said screen color gamut



having mutually exclusive portions and mutually inclusive portions within said predefined color gamut; and

selecting the mutually exclusive portions of said printer color gamut for printing the monitor image in vivid colors, said vivid colors not being visible to a user viewing the monitor image but being visible in a printed image formed on a print medium.

6,015,208

DRIVING CIRCUIT FOR A CONTROL ELECTRODE PROVIDED IN AN IMAGE FORMING APPARATUS

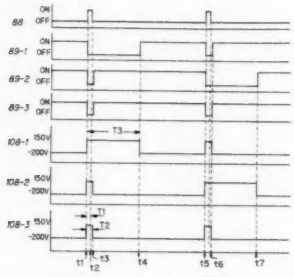
Shirou Wakahara, Osaka, and Kazuya Masuda, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 14, 1998, Appl. No. 7,157

Claims priority, application Japan, Jan. 23, 1997, 9-010593; Aug. 14, 1997, 9-219646

Int. Cl.[7] B41J *2/06*

U.S. Cl. 347—55 **14 Claims**



1. A driving circuit for driving a control electrode having a plurality of control sections in an image forming apparatus which creates an image by making selected substantially identically electrostatically charged toner particles contained in a substantially continuous layer thereof carried by a toner support jump from the toner support to an electrostatically charged recording medium by electric force; said driving circuit comprising:

a first semiconductor switch, said first semiconductor switch having the capability of alternately assuming an on state and an off state, and including a drain and a source, said source being adapted to be connected to a high-voltage power supply;

a plurality of diodes, each said diode comprising an anode and a cathode, said anodes of said plurality of diodes being connected in common to said drain of said first semiconductor switch; and

a plurality of second semiconductor switches, each of said second semiconductor switches having the capability of alternately assuming an on state and an off state, and including (a) a drain connected (i) to a cathode of a corresponding one of said plurality of diodes and (ii) to an output terminal adapted to be connected to a corresponding one of said control sections of said control electrode, and (b) a source connected in common with the sources of the other second semiconductor switches to a low-voltage power supply;

said driving circuit being further characterized in that:

said first semiconductor switch is normally in said off state and is adapted to be caused to assume its on state at a selected point in time defining a reference point for driving said control electrode, and subsequently to be caused to reassume its normal off state after a first predetermined period of time;

selected ones of said plurality of second semiconductor switches each are normally in their respective on states, and are adapted to be caused to assume their respective off states at said selected point in time and thereafter to be caused to reassume their respective on states after a second predetermined period of time; and

the remainder of said plurality of second semiconductor switches each are normally in their respective on states, and are adapted to be caused to assume their respective off states at said selected point in time and thereafter to be caused to reassume their respective on states after a third predetermined period of time;

said second predetermined period of time being longer than said first predetermined period of time, and shorter than said third predetermined period of time;

whereby a voltage substantially equal to that supplied by said high-voltage power supply or a voltage substantially equal to that supplied by said low-voltage power supply always appears on the respective drains of each of said plurality of second semiconductor switches for output via said output terminal to a corresponding section of said control electrode during the operation of said driving circuit.

6,015,209

REPLACEABLE INK CONTAINER WITH FLUID INTERCONNECT FOR COUPLING TO AN INK-JET PRINTER

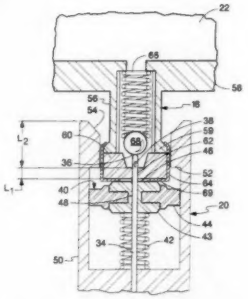
John A. Barinaga, Portland; James E. Clark, Albany; David O. Merrill, Corvallis, all of Oreg.; Ngoc-Diep Nguyen, Camas, Wash., and David R. Otis, Jr., Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of application No. 08/566,821, Dec. 4, 1995, Pat. No. 5,777,646, and a continuation-in-part of application No. 08/429,915, Apr. 27, 1995, Pat. No. 5,825,387. This application Apr. 1, 1998, Appl. No. 53,556.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B41J *2/175*

U.S. Cl. 347—86 **17 Claims**



1. A removable ink supply for forming a fluid connection with an ink-jet printer into which the ink supply is removably installed, the ink-jet printer having a fluid inlet and a fluid conduit for supplying liquid ink to an ink-jet printhead, the removable ink supply comprising:

a quantity of liquid ink;

a fluid outlet comprising (i) a hollow boss having a first end in fluid communication with the quantity of liquid ink, and a

second end forming a neck, the neck defining a sealing surface and an opening; (ii) a first sealing member positioned within the neck of the boss, the first sealing member defining a slit, the slit having a closed orientation wherein liquid ink is prevented from flowing through the slit and the opening and an open orientation wherein liquid ink flows through the slit and the opening; (iii) a second sealing member positioned within the boss, the second sealing member being movable between a first position in which the second sealing member prevents liquid ink from flowing to the slit, and a second position in which liquid ink flows to the slit; and (iv) a biasing structure for biasing the second sealing member toward the first position; and

wherein the ink supply fluid outlet is removably connectable with the fluid inlet of the ink-jet printer, such that the first sealing member is engageable with the fluid inlet and displaced from the first orientation to the second orientation by the fluid inlet, the second sealing member is engageable with the fluid inlet and displaced from the first position to the second position by the fluid inlet, and the sealing surface is engageable against the fluid inlet to create an ink seal.

6,015,210

INK CONTAINER WITH TWO INK ABSORBING MEMBERS FOR CONTROLLING INK FLOW TO A RECORDING HEAD

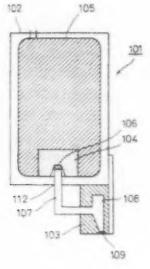
Daigoro Kanematsu; Masanori Takenouchi; Naoji Otsuka, all of Yokohama; Toshihiko Ujita, Yamato; Kentaro Yano, Yokohama, and Osamu Iwasaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/342,044, Nov. 17, 1994, abandoned. This application Oct. 15, 1997, Appl. No. 951,165.

Claims priority, application Japan, Nov. 29, 1993, 5-298193; Jan. 25, 1994, 6-006597

Int. Cl.[7] **B41J** *2/175*

U.S. Cl. 347—87 **23 Claims**



15. An ink jet apparatus comprising:

a recording head having plural discharge ports each having a liquid passage, a liquid chamber common to said plural liquid passages, and an ink supply pipe for supplying ink to said common liquid chamber;

a recovery structure for sucking ink from said plural liquid passages of said recording head, so as to recover ink discharge of said recording head;

an ink container attachable and detachably mountable to said recording head; and

a carriage on which said recording head and said ink container are mountable as one unit for scanning motion across a recording medium;

wherein said ink container comprises:

an opening in said ink container for supplying ink to the ink supply pipe of the recording head; a first ink absorber located in said ink container adjacent said opening, wherein a volume Z of said first ink absorber and a total volume V of the ink supply pipe, the common liquid chamber and the plural passages, have a relationship expressed by $3\ V<Z<10\ V$; and

a second ink absorber, said second ink absorber being located in said ink container adjacent said first ink absorber and not adjacent said opening.

6,015,211

PORTABLE PRINTING DEVICE WITH SHUTTER FOR COVERING PRINT HEAD

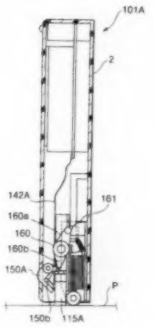
Naohisa Kinoshita, and Koji Imai, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 20, 1997, Appl. No. 879,633

Claims priority, application Japan, Jun. 21, 1996, 8-181339; Jun. 21, 1996, 8-181340; Jul. 17, 1996, 8-207903; Dec. 28, 1996, 8-358507

Int. Cl.[7] **B41J** *3/36*

U.S. Cl. 347—109 **34 Claims**



1. A portable printing device for printing an image on a print medium, the portable printing device comprising:

a case;

an ink jet print unit having a print head with a print surface formed with nozzles for ejecting ink, the print head being switchable between a raised position and a lowered position with respect to the case; and

a shutter member having a cap which intimately covers the print surface of the print head when the print head is in said raised position.

6,015,212

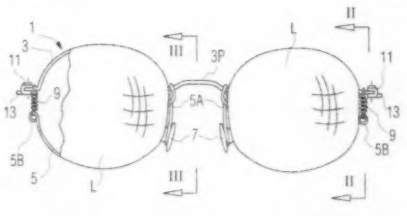
EYEGLASS FRAME MADE OF WIRE WITH AN ELASTIC ELEMENT

Paolo Fortini, Florence, Italy, assignor to Bottega D'Arte in Firenze S.R. L., Italy

Filed Jul. 23, 1998, Appl. No. 121,740

Int. Cl.[7] **G02C** *1/08*

U.S. Cl. 351—92 **20 Claims**



1. An eyeglass frame for first and second lenses, the frame comprising:

a mount for the first and second lenses, said mount including an upper wire, a first lower wire for the first lens, and a second

lower wire for the second lens, said first lower wire having a first end fastened to said upper wire and having a second end, said mount including a first elastic element connecting said second end of said first lower wire to said upper wire, said second lower wire having a first end fastened to said upper wire and having a second end, said mount including a second elastic element connecting said second end of said second lower wire to said upper wire;

two temples hinged to said mount.

6,015,213

RING FOR A HARD CONTACT LENS AND HARD CONTACT LENS COMPOSITE EMPLOYING SUCH A RING

Kazuhiko Nakada, and Akihisa Sugiyama, both of Kasugai, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Jun. 3, 1998, Appl. No. 89,503

Claims priority, application Japan, Jun. 27, 1997, 9-172238

Int. Cl.[7] G02C *7/04*

U.S. Cl. 351—172 **12 Claims**

1. A ring for a hard contact lens, which can be detachably attached to the peripheral edge of a hard contact lens and which has a groove of a shape corresponding to the peripheral edge of the hard contact lens, formed along the inner periphery of the ring, wherein in the ring, the length of an upper flange engageable with the front side of the peripheral edge of the hard contact lens, is shorter than the length of a lower flange engageable with the rear side of the peripheral edge of the lens.

6,015,214

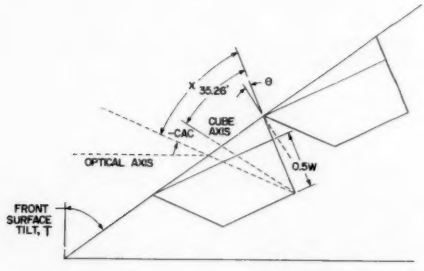
RETROREFLECTIVE ARTICLES HAVING MICROCUBES, AND TOOLS AND METHODS FOR FORMING MICROCUBES

Sidney A. Heenan, Park Ridge; Anthony J. Montalbano, Barrington; Liviu A. Coman, Des Plaines, and Dennis I. Couzin, Evanston, all of Ill., assignors to Stimsonite Corporation, Niles, Ill.

Filed May 30, 1996, Appl. No. 655,595

Int. Cl.[7] G02B *5/122*

U.S. Cl. 359—529 **5 Claims**



1. An article comprising an array of microcubes, such that for every plane in space there are two adjacent microcubes for which at the place of adjacency none of the face edges is parallel to that plane, and in which at least one microcube of said array is rectangular or pentagonal, said at least one microcube of said array being canted face-more-parallel.

6,015,215

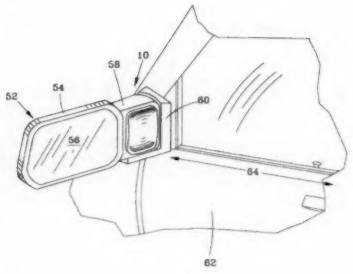
NON-OBSTRUCTIVE, AUXILIARY REAR VIEW MIRROR ASSEMBLY AND MOUNTING APPARATUS

Michael J. Herman, 6814 Still Meadow, Houston, Tex. 77389

Filed Feb. 28, 1997, Appl. No. 810,628

Int. Cl.[7] G02B *5/10*

U.S. Cl. 359—864 **10 Claims**



1. A non-obstructive, auxiliary rear view mirror assembly and mounting apparatus to generally provide the driver of a vehicle with a full view of the vehicle's blind spot, while generally avoiding any obstruction of and contact to a reflective mirror surface of a collapsible factory-mounted side view mirror assembly, comprising:

a non-circular, convex mirror body;

a mounting bracket having a planar back portion and an open front portion to receive said non-circular, convex mirror body; and

a mounting apparatus affixed to the back of said mounting bracket to affix said mounting bracket to a support member of the collapsible, factory-mounted side view mirror assembly, wherein said convex mirror body is positioned on the support member wholly laterally inboard of the factory-mounted side view mirror assembly, and said non-circular, convex mirror body and mounting bracket are mounted on the support member between a reflective mirror surface of the factory-mounted side view mirror assembly and an exterior surface of the vehicle, to provide cooperation between said convex mirror body and a fixed mounting bracket of the factory-mounted side view mirror assembly such that when said factory-mounted side view mirror is in a collapsed engagement to the fixed mounting bracket of the factory-mounted side view mirror assembly, there is no contact between said convex mirror body and the fixed mounting bracket of the factory-mounted side view mirror assembly.

6,015,216

FISH TANK WITH ILLUMINATING LIGHT GUIDE DEVICE

Yasushi Nakamura, Narashino, Japan, assignor to Hirose Co., Ltd., Narashino, Japan

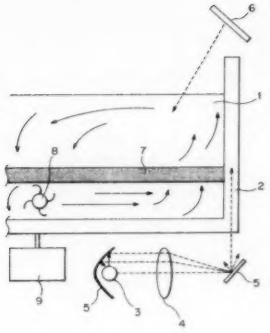
Filed Dec. 4, 1997, Appl. No. 984,767

Claims priority, application Japan, Aug. 29, 1997, 9-273221

Int. Cl.[7] F21V *8/00*

U.S. Cl. 362—96 **6 Claims**

1. A water tank with an illuminating device comprising: a source of light and a means for directing the light positioned outside of the water tank and below a bottom of the tank, arranged to illuminate a lower end of a light guide made of transparent material, to guide the light upwards, an upper part of the light guide positioned above a level of water in the water tank, and a reflecting surface arranged

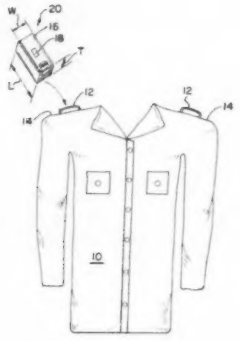


to reflect the guided light toward the water when the water tank contains water.

6,015,217
UNIFORM EPAULET-COUPLED EMERGENCY FLASHLIGHT

David W. Colangelo, 5 Tracy Pl., and Robert D. Burns, 225 Azalea Cir., both of Jackson, N.J. 08527

Filed Feb. 2, 1999, Appl. No. 241,917
Int. Cl.[7] F21L *15/08*
U.S. Cl. 362—103 **13 Claims**



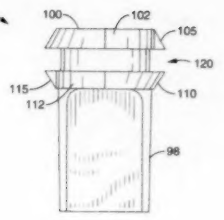
1. The combination comprising:
a flashlight in a housing of given size dimension, and with said housing having a fastener at a top surface thereof; and
a shoulder epaulet on an article of clothing;
with said flashlight being selected of size dimension to fit said flashlight within said epaulet when said article of clothing is worn, and with said fastener of said housing then being secured to said epaulet.

6,015,218
LIGHTING DISPLAY AND ASSEMBLY KIT

Lloyd D. Snell, 2017 Stevenson, Ames, Iowa 50010

Continuation-in-part of application No. 08/668,902, Jun. 24, 1996, abandoned. This application Jul. 3, 1998, Appl. No. 111,254.
Int. Cl.[7] F21V *21/00*
U.S. Cl. 362—249 **5 Claims**

1. A versatile lighting decoration, comprising:
a) a display sheet comprising:
i) a transparent and resilient film;

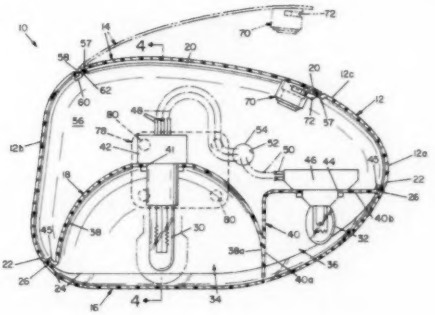


ii) an outline of a predetermined shape denoted on said transparent and resilient film;
iii) a plurality of first apertures positioned along said outline of said predetermined shape; and
b) at least one string of primary lights comprising:
i) a plurality of bulbs connected together by wiring terminating in a plug and
ii) a plurality of film gripping sockets for holding said plurality of bulbs, wherein each said film gripping socket comprises:
a bulb and wire receiving body having first and second ends, wherein said bulb extends from said first end and said wire extends from said second end;
a first film gripping means protruding from said bulb and wire receiving body; and
a second film gripping means protruding from said bulb and wire receiving body.

6,015,219
AUXILLIARY LAMP UNIT

Fred E. Kelly, Oakville, Canada, assignor to The Louis Berkman Company, Steubenville, Ohio

Filed Feb. 5, 1998, Appl. No. 18,930
Int. Cl.[7] F21V *31/02*
U.S. Cl. 362—267 **24 Claims**



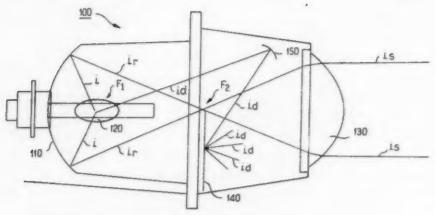
1. An auxiliary vehicle light comprising a housing having top and bottom walls, a pair of side walls and front and rear walls, an opening in said front wall, a lens permanently mounted on said front wall for sealingly closing said opening therein, a reflector in said housing having a surface for reflecting light toward said lens and having a peripheral edge permanently and sealing connected to said housing for said lens and said reflector to provide a light chamber therebetween in said housing, an opening in said rear wall, a light bulb receptacle removably mounted on said reflector for supporting a light bulb in said light chamber, said receptacle being accessible through said opening in said rear wall for removal from said reflector, and a door for closing said opening in said rear wall.

6,015,220

ELLIPTICAL HEADLAMP WITH AN ATTENUATED CUT-OFF

Eric Blusseau, Malmaison, France, assignor to Valeo Vision, Bobigny, France

Filed Oct. 13, 1998, Appl. No. 170,591
Claims priority, application France, Oct. 14, 1997, 97 12816
Int. Cl.[7] F21V *7/00*
U.S. Cl. 362—303 **20 Claims**



1. A headlamp for a vehicle comprising:

a reflector having a first focus and a second focus;

a light source positioned in a region of the first focus;

a lens having a focus in a region of the second focus;

a mask interposed between the reflector and the lens to effect a cut-off of an emitted light beam; and

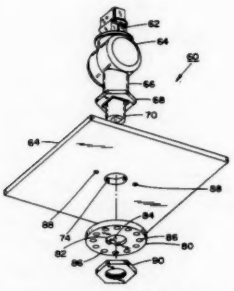
a mirror disposed in front of the mask and positioned to return direct light rays emitted by the light source onto a face of the mask to diffuse the direct light rays towards the lens.

6,015,221

ARRANGEMENT FOR THE ATTACHMENT OF A LAMPHEAD TO A PANEL

Steven W. Bodell, Troutville, Va., assignor to Hubbell Incorporated, Orange, Conn.

Filed Apr. 2, 1998, Appl. No. 53,899
Int. Cl.[7] F21V *21/28*
U.S. Cl. 362—427 **12 Claims**



1. An arrangement for attaching a lamphead to a panel; comprising:

(a) an elongate post member having means for mounting a lamphead at one end, an externally screwthreaded stub shaft extending from the opposite end of said post member, stop means being formed on said post member at the juncture with said stub shaft for contacting a first surface of said panel upon said stub shaft being passed through a hole in said panel;

(b) a disk member having a center hole being slidable onto said stub shaft from an opposite side of said panel; first cooperative engaging means on said disk member and stub shaft preventing relative rotation therebetween upon said stub shaft being passed through said center hole;

(c) lock nut means threadidly engaging said stub shaft so as to bias said disk member into contact with the opposite side of said panel;

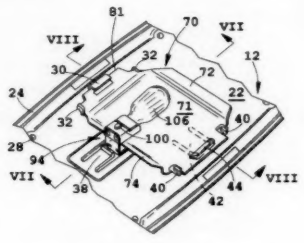
(d) and second cooperative engaging means on said disk member and said opposite side of the panel for latching said disk member and said panel in one of a multiplicity of selective rotationally adjusted positions relative to each other upon securing of said lock nut means.

6,015,222

LIGHT FIXTURE WITH SNAP-IN COMPONENTS

John W. Schindler, Huntington, Ind., assignor to Tekonsha Engineering Company, Tekonsha, Mich.

Filed Dec. 5, 1997, Appl. No. 985,945
Int. Cl.[7] B60Q *3/02*
U.S. Cl. 362—490 **19 Claims**



1. A surface-mounted light fixture for recreational vehicles and the like comprising:

a housing;

a lens having an annular rim including at least one extending tab portion;

a mounting bracket for a light-emitting element;

a switch for activating said light-emitting element;

a reflective plate for dispersing light generated by said light-emitting element, said reflective plate having perimeter edges, said perimeter edges having at least a pair of mutually spaced flange sections; and

said housing having a plurality of tabs for mounting and retaining at least one of said reflective plate and said bracket in place, and further having at least one opening for receiving said at least one extending tab portion of said lens to mount said lens in place upon said housing, at least a pair of said plurality of tabs being mutually spaced and positioned for registering alignment with said pair of mutually spaced flange sections of said reflective plate perimeter edges, said registering aligned tabs and flange sections being configured to engage and interfit with one another to mount said reflective plate upon said housing in mutually fixed relation.

6,015,223

OPTICAL SUBASSEMBLY FOR CENTER HIGH MOUNT STOP LAMP

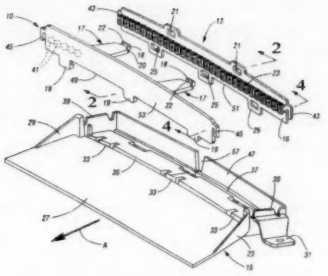
Robert Andrew Kidd, Alexandria, and Nova Kay Filbrun, Pendleton, both of Ind., assignors to Guide Corporation, Anderson, Ind.

Filed Feb. 26, 1998, Appl. No. 32,502
Int. Cl.[7] B60Q *1/00*
U.S. Cl. 362—503 **8 Claims**

1. A lighting subassembly characterized by a predetermined focal distance between a planar array of point illumination sources and lens optics comprising:

a planar light source carrier for said array formed with an aperture between front and back sides thereof; and,

a planar lens carrier including an extension substantially perpendicular to the plane of the lens carrier, said extension having a distal end having first and second opposing surfaces spaced along the axis of perpendicularity and substantially normal



thereto, said light source carrier and extension adapted for insertion of one of the opposing surfaces through the aperture when the light source carrier and lens carrier share a first orientation and for trapping the light source carrier between the first and second opposing surfaces when the light source carrier and lens carrier share a second orientation.

6,015,224

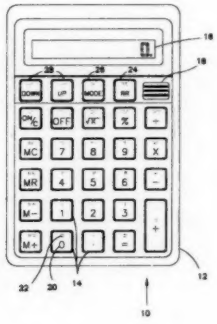
CALCULATOR

Bonnie Greenstein, 1310 Ave. R (Apt. #2-M), Brooklyn, N.Y. 11229

Filed Mar. 13, 1996, Appl. No. 614,665

Int. Cl.[7] **G06F** *3/00*

U.S. Cl. 364—710.08 **11 Claims**



1. A calculator, comprising:

a control unit;

a keyboard for inputting numerals and functions to the control unit, having keys representing numerals and functions, each key has a tactile symbol being a Braille representation representing the numeral and function of the key;

an arithmetic unit for performing numerical calculations and providing a result having at least one numeral to the control unit;

a result indication means, for outputting the result in a manner selected from audibly and tactiley, comprising a tactile result indicator that communicates a result by producing counting pulses equal in number to the numeral being communicated.

6,015,225

VIBRATION INPUT TO MOVING AQUEOUS CEMENTITIOUS SLURRY

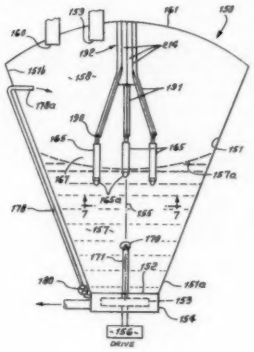
Richard A. Williams, Dana Point, Calif., assignor to Matrix Master Inc., Newport Beach, Calif.

Continuation-in-part of application No. 08/615,597, Mar. 13, 1996, Pat. No. 5,813,754. This application Aug. 12, 1997, Appl. No. 909,644.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B28C** *5/16;* **B01F** *11/00*

U.S. Cl. 366—6 **63 Claims**



1. The method of treating an aqueous, cementitious slurry, to enhance fluidity, that includes:

a) providing a vessel for the slurry and effecting movement of the slurry, in the vessel, the vessel having an interior, and

b) locating at least one vibrator in the interior of the vessel, and operating said at least one vibrator to transmit vibration from within the vessel to the moving slurry, to lower the water/cement ratio to or below about 0.30.

6,015,226

SCREW-TYPE EXTRUSION MACHINE HAVING TIE RODS LOADED BY A PRE-STRESSED SPRING SYSTEM

Ulrich Weller, Ingersheim, and Rainer Sauter, Remseck, both of Germany, assignors to Krupp Werner & Pfleiderer GmbH, Germany

Filed Sep. 11, 1998, Appl. No. 151,787

Claims priority, application Germany, Sep. 17, 1997, 197 40 836; Aug. 17, 1998, 198 37 171

Int. Cl.[7] **B29B** *7/80*

U.S. Cl. 366—79 **9 Claims**

1. A screw-type extrusion machine comprising a composite casing (**2**) which comprises casing sections (**3**, **4**) fitted together in a longitudinal direction of the casing (**2**), the casing sections (**3**, **4**) being tightly tautened relative to each other by a plurality of tie rods (**7**) which extend parallel to each other in the longitudinal direction of the casing (**2**) on an outside thereof, wherein each tie rod (**7**) is loaded in said longitudinal direction by a pre-stressed spring system.

6,015,227

THERMOPLASTIC FOAM EXTRUSION SCREW WITH CIRCULATION CHANNELS

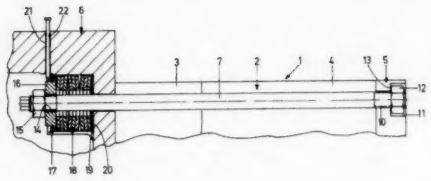
James Fogarty, 4970 Alfresco St., Boca Raton, Fla. 33428

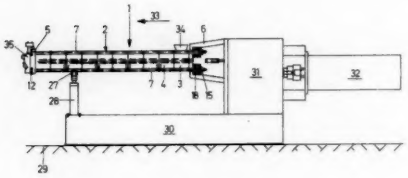
Filed May 26, 1998, Appl. No. 85,316

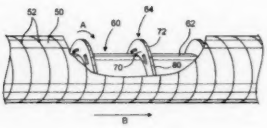
Int. Cl.[7] **B29B** *7/42*

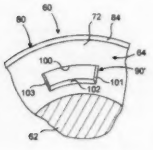
U.S. Cl. 366—81 **15 Claims**

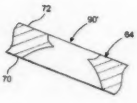
14. To be disposed within an extrusion barrel of a thermoplastic extrusion assembly, a homogenization enhancing extrusion screw comprising:

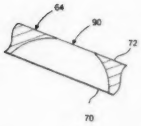












6,015,228

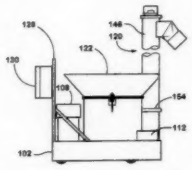
DRY MATERIAL AND SLURRY PROCESSOR

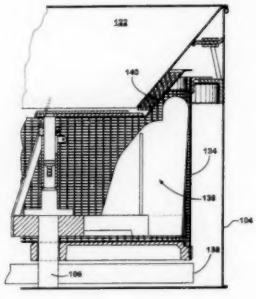
Ernst R. Muller; Michael R. Muller, and Steve J. Cencich, all of Box 1653, Grand Rapids, Mich. 49501

Continuation-in-part of application No. 08/978,079, Nov. 11, 1997, Provisional application No. 60/031,456, Nov. 26, 1996. This application Dec. 2, 1997, Appl. No. 982,686.

Int. Cl.[7] B01F *15/02;9/10*

U.S. Cl. 366—186 4 Claims





an elongate shaft, said elongate shaft disposed in the extrusion barrel;

at least one screw flight extending from said elongate shaft;

said screw flight including a leading surface, a trailing surface, and a perimeter edge;

said screw flight being structured and disposed such that said perimeter edge of said screw flight is disposed in substantially closely spaced relation to an interior surface of the extrusion barrel and an extrusion mixture contained in the extrusion barrel is moved to an end of the extrusion barrel at least partially as a result of said screw flight; and

said screw flight including at least one circulation channel extending from said leading surface towards said trailing surface thereof, said circulation channel structured to permit a quantity of the extrusion mixture disposed at said leading surface of said screw flight and in spaced apart relation from the interior surface of the extrusion barrel to pass therethrough towards said trailing surface of said screw flight and thereby urge a quantity of the extrusion mixture disposed at said trailing surface of said screw flight and in spaced apart relation from the interior surface of the extrusion barrel to move upward toward the interior surface of the extrusion barrel; and

said circulation channel including an asymmetrical inlet area so as to disrupt a flow pattern of said extrusion mixture through said circulation channel and thereby maximize a homogenization thereof.

1. A material processor comprising:

an enclosure having an ingress to receive material into the enclosure, and a discharge to remove material from the enclosure;

a spindle located in the enclosure, the spindle having a longitudinal spindle axis and being rotatable about the spindle axis;

a drive operatively connected with the spindle to rotate the spindle about the spindle axis;

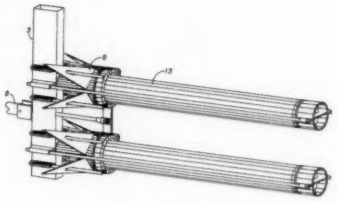
a sieve located in the enclosure and coupled with the spindle, the ingress feeding material into the sieve; and

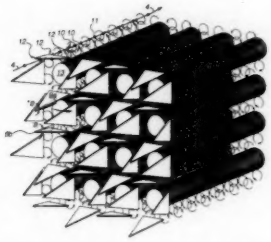
a conveyer operatively connected with the discharge to transfer material, the conveyor having a generally cylindrical tube with a tube diameter, with two opposing ends, and with an axis extending through the ends, and having a helical blade extending along the axis between the two ends, the helical blade being rotatable about the axis and being rotated at high speed, the blade further having a series of blade tips spaced along the axis, and wherein the space between adjacent blade tips is less than or equal to about one half of the tube diameter, the tube further including first and second tube sections that are coupled together with a clamp ring, the first section having a male end with a male flange, the second section having a female end with a corresponding female flange, the male and female ends and flanges abutting one another to define a generally truncated V-shaped ridge that extends outward from the tube with opposing inclined surfaces, the clamp ring overlaying and pressing inward upon the inclined surfaces to press the male and female flanges and ends together.

6,015,229
METHOD AND APPARATUS FOR IMPROVED MIXING IN FLUIDS

Donald Cormack, Scarborough, and Keith Bircher, Toronto, both of Canada, assignors to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Sep. 19, 1997, Appl. No. 933,573
Int. Cl.[7] **B01F** *5/06;* **B01J** *19/12*
U.S. Cl. 366—336 **65 Claims**





1. An apparatus for mixing at least one fluid flowing through a fluid system, comprising:

A. at least one first member with at least one surface elongated in at least one dimension such that the axis of one of said elongated surfaces is substantially aligned with the direction of said fluid flow;

B. at least one second member having at least one surface located in spaced relationship to one of said elongated surfaces that is substantially aligned with the direction of said fluid flow;

wherein at least one said surface of said at least one second member is shaped and oriented to interact with said fluid flow to create at least one vortex in said fluid that rotates with an axis substantially aligned and sustained along the direction of said fluid flow.

6,015,230
METHOD AND APPARATUS FOR TESTING HEAT DETECTORS

James C. Wantz, Mesa, Ariz., and Leon Cooper, 29706 Baden Pl., Malibu, Calif. 90265, assignors to Leon Cooper, Malibu, Calif.

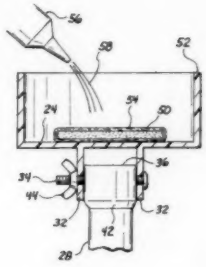
Filed Oct. 1, 1997, Appl. No. 942,007
Int. Cl.[7] **G08B** *29/00;* **G01K** *15/00*
U.S. Cl. 374—1 **13 Claims**

1. A method for testing a heat detector having a heat sensor and mounted at an elevated location above a ground surface, comprising the steps of:

providing a composition formulated to react exothermically but non-flammably and to release steam upon being wetted so as to sustain a temperature sufficient to activate the heat detector under test;

wetting said composition to initiate an exothermic reaction; and

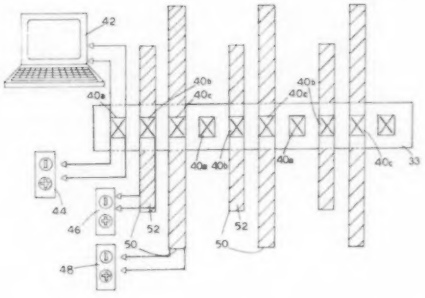
elevating said composition into contact with or sufficient proximity to an underside of said heat detector to expose said heat sensor to heat and steam produced by the exothermic reaction without intervening heat insulation and steam barriers between said composition and said heat detector thereby to permit both heat and steam rising from said composition to reach the heat sensor of the detector such that heat is more effectively delivered to the heat sensor by contact thereof with steam from the exothermic reaction.



6,015,231
METHOD FOR CONSERVATIVELY EVALUATING CONTINUOUS THERMAL TREATMENT PROCESS FOR A PARTICULATE-CONTAINING FOOD PRODUCT STREAM

Kenneth R. Swartzel, and Josip Simunovic, both of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Division of application No. 08/946,277, Oct. 7, 1997. This application Apr. 29, 1999, Appl. No. 301,921.
Int. Cl.[7] **G01K** *3/04*
U.S. Cl. 374—102 **3 Claims**



1. A method for conservatively evaluating thermal treatment in a continuous thermal process for a stream of a particulate-containing food product, the method comprising the steps of:

(a) inserting at least one detectable particle tagged with at least one magnetic implant into the stream at pre-selected intervals, the detectable particle further comprising a cargo component capable of providing thermal history data for the particle, and wherein said at least one detectable particle possesses a lower thermal conductivity than any particle in said particulate-containing food product;

(b) detecting the at least one implant using at least one sensor located at a detection point downstream from a location of the inserting of the at least one detectabie particle, the sensor having a sensitivity such that the sensor is capable of detecting a magnetic field at least as low as 0.05 oersteds, said detectable particle having a lower speed boundary limit of zero velocity;

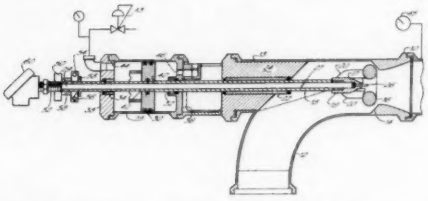
(c) obtaining said thermal history data from said cargo component of said at least one detectable particle at said detection point; and

(d) evaluating said thermal treatment for the stream using said thermal history data.

6,015,232
CONSTANT VELOCITY TEMPERATURE PROBE IN A PRODUCT FLOW LINE

Lloyd F. Hay, Oakdale, and Thomas L. Dambak, Acampo, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Jun. 19, 1998, Appl. No. 99,995
Int. Cl.[7] **G01K** *13/02;7/04;7/16;5/02;5/62*
U.S. Cl. 374—138 **17 Claims**



10. An apparatus for sensing the temperature of a flowable product moving through a product flow line, the apparatus comprising:

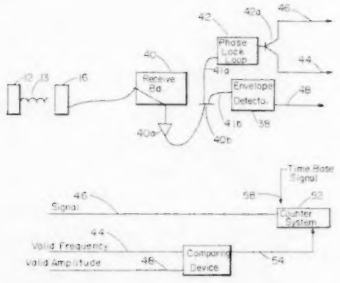
a temperature sensing probe adapted to be disposed in the flowable product; and

a valve member connected for movement adjacent said temperature sensing probe, said valve member responding to changes in flow velocity of the product moving through the product flow line such that said valve member opens in response to higher flow velocities and closes in response to relatively lower flow velocities thereby maintaining a substantially constant product flow velocity past said temperature sensing probe.

6,015,233
SYSTEM FOR MONITORING THE TEMPERATURE OF A ROTATING DEVICES

William S. Hicks, Sarasota, Fla., assignor to HTI Technologies, Inc., St. Petersburg, Fla.

Filed Dec. 22, 1997, Appl. No. 995,319
Int. Cl.[7] **G01K** *13/08;* **G08C** *19/00*
U.S. Cl. 374—153 **8 Claims**



1. An improved system for monitoring the temperature of a rotating device comprising:

a sensing means responsive to temperature stimuli of a rotating device thereby producing a signal;

an antenna means responsive to said signal of said sensing means coupled to a receiver means;

an amplification means coupled to said receiver means;

a first splitting means coupled to said amplification means for splitting said signal from said amplification means into a first amplified signal and a second amplified signal;

a phase lock loop circuit coupled to said first amplified signal;

a second splitting means coupled to said phase lock loop circuit outputting a valid frequency signal and said first amplified signal;

an amplitude modulation discriminator means coupled to said second amplified signal for validating an amplitude of said second amplified signal thereby producing a valid amplitude signal;

a comparing device coupled to both said valid frequency signal and said valid amplitude signal for comparison of said valid frequency signal and said valid amplitude signal whereby said comparing device produces a control line signal;

a counter logic circuit receiving said control line signal, said first amplified signal of said second splitting means, and a time based signal whereby said control line signal, said first amplified signal of said second splitting means, and said time based signal are synchronized;

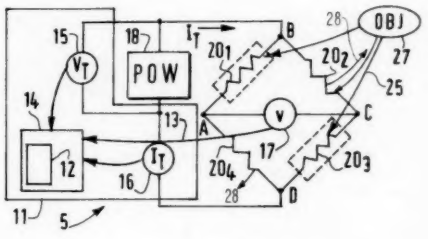
said counter logic circuit producing a synchronous signal; and

a microprocessor coupled to said synchronous signal for calculating the temperature of said rotating device based on said synchronous signal.

6,015,234
NON-CONTACTING TEMPERATURE MEASURING DEVICE

Serge Gourrier, Paris, and Jean-Pierre Hazan, Sucy, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1997, Appl. No. 812,224
Claims priority, application France, Mar. 6, 1996, 96 02814
Int. Cl.[7] **G01K** *7/00*
U.S. Cl. 374—164 **9 Claims**



1. A device (**5**) for measuring temperatures without mechanical contact, comprising a bolometer arranged as a Wheatstone bridge, power supply means (**18**) connected to a diagonal arm of the bridge, and detection means (**17**) for measuring an unbalance voltage (v) in another diagonal arm of the bridge,

the bolometer comprising elements (20_1, 20_2, 20_3, 20_4) sensitive to temperature variations, some of the elements (20_2, 20_4) being shielded and some of the elements (20_1, 20_3) being not shielded so as to allow or not to allow, respectively, the temperatures of the elements to be changed by net thermal radiation (**25**) between said elements and an object (**27**) arranged opposite the bolometer, and further comprising heating means (**26**, **18**) for producing additional heating of the elements, characterized in that:

the bolometer comprises two shielded elements (20_2, 20_4) and two non-shielded elements (20_1, 20_3), which are respectively arranged diagonally opposite one another in the bridge,

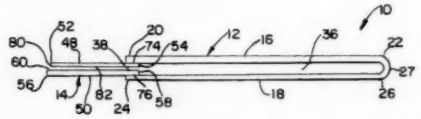
the heating means causes the temperatures of the elements (20_1, 20_2, 20_3, 20_4) to vary until the detection means (**17**) produces a null unbalance voltage (v), thereby indicating that equality in temperature is achieved between the non-shielded elements (20_1, 20_3) and the object,

the device (**5**) comprises temperature measuring means (**11**) for determining the temperature, common to the non-shielded elements and to the object, at which cancellation of the unbalance voltage is achieved.

6,015,235
PUNCTURE-RESISTANT BARRIER POUCH

Amy L. Kraimer, Omro; Gregory Pockat, Ripon, both of Wis., and David Wohlert, Midlothian, Va., assignors to Curwood, Inc., Oshkosh, Wis.

Provisional application No. 60/040,077, Mar. 7, 1997. This application Feb. 25, 1998, Appl. No. 30,684.
Int. Cl.[7] B65D *30/02*
U.S. Cl. 383—109 **36 Claims**



1. A puncture resistant barrier pouch for the packaging of bone-in meat and other products, said pouch including:

a body portion including a first wall and a second wall overlying said first wall, said first wall connected to said second wall about a portion of its periphery, a chamber formed between said first wall and said second wall adapted to receive and contain the product, said first wall and said second wall each being formed from a puncture resistant film, a mouth formed between said first wall and said second wall that is in communication with said chamber, said first wall and said second wall each having a respective inner surface and a respective outer surface, said first wall having a first thickness extending between said inner surface and said outer surface of said first wall, said second wall having a second thickness extending between said inner surface and said outer surface of said second wall, said puncture resistant film including a heat sealable first layer, a second layer, and a core layer disposed between said first and second layers, said core layer being formed from an oxygen barrier material; and

a neck portion including a third wall, a fourth wall overlying said third wall, and a product passage formed between said third wall and said fourth wall, said third wall and said fourth wall each being formed from a heat sealable film, said neck portion being attached to said body portion such that said product passage is in communication with said mouth of said body portion and with said chamber of said body portion, said third wall and said fourth wall each having a respective inner surface and a respective outer surface, said third wall having a third thickness extending between said inner surface and said outer surface of said third wall, said fourth wall having a fourth thickness extending between said inner surface and said outer surface of said fourth wall, said third and fourth thicknesses of said third and fourth walls of said neck portion being respectively thinner than each of said first and second thicknesses of said first and second walls of said body portion;

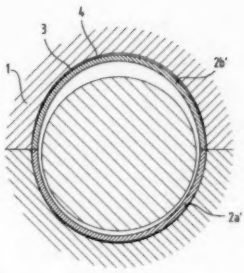
whereby, said relatively thin third wall and fourth wall of said neck portion may be easily heat sealed together thereby sealing closed said product passage of said neck portion and said chamber of said body portion, and said relatively thick first and second walls of said body portion provide increased resistance to puncturing of said body portion by the product.

6,015,236
THIN-WALLED PLAIN BEARING

Fritz Niegel; Guido Schöneich, both of Oestrich-Winkel; Gerhard Arnold, Heidenrod, and Werner Lucchetti, Walluf, all of Germany, assignors to Glyco-Metall-Werke Glyco B.V. & Co.KG, Wiesbaden, Germany

Filed Sep. 10, 1998, Appl. No. 150,807
Claims priority, application Germany, Sep. 11, 1997, 197 39 929
Int. Cl.[7] F16C *9/02;33/02*
U.S. Cl. 384—276 **2 Claims**

1. A plain bearing comprising a metal backing layer and at least one bearing material layer applied to said backing layer, said



bearing having a predetermined external bearing diameter D, an effective wall thickness W_{eff} and an installation free spread S, and characterized by

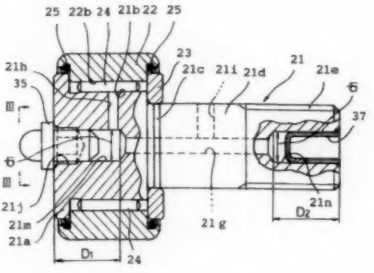
the ratio of $W_{eff}/D=0.012 \leqq W_{eff}/D \leqq 0.02$, and

the ratio of $S/D=0.025 \leqq S/D \leqq 0.05$.

6,015,237
TRACK ROLLER BEARING WITH STUD

Yoshitaka Ogawa, Gifu, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1997, Appl. No. 991,769
Claims priority, application Japan, Jan. 9, 1997, 9-013407
Int. Cl.[7] F16C *19/00;* **F16H** *53/06*
U.S. Cl. 384—475 **3 Claims**



1. A track roller bearing with stud, comprising:

a stud in the shape of a shaft, said stud comprising in order from one end surface:

a flange,

a track portion having an outer circumference which serves as a track surface,

a side plate engaging portion,

an attaching portions, and

a threaded portion;

an outer ring, said outer ring being in the form of a thick-walled ring having a diameter larger than an outer diameter of said flange, said outer ring having a track surface formed on its inner inside surface and said outer ring being inserted adjacent said stud while being allowed to rotate freely corresponding to the track surface of said stud;

wherein said flange prevents one end of said outer ring from moving out in an axial direction;

a plurality of rolling elements juxtaposed between each said track surface of said stud and said outer ring;

a side plate in the form of a doughnut-shaped plate similar in size to the outer diameter of said flange, said side plate located on the other end of said outer ring from said flange, an inner diameter of said side plate which engages with said side plate engaging portion, and serves to prevent said outer ring and rolling elements, in cooperation with said flange, from moving out in the axial direction;

said track roller bearing with stud further comprising:

a hexagonal hole formed in said one end surface of said stud where the flange is disposed, which engages with a tightening tool, and which extends into said track portion;

a lubricating duct for supplying lubricant, said lubricating duct disposed along an axis of said stud extending from a lubricant supply port formed in the other end surface of said stud at the threaded portion, to each said track surface via a lubricating hole and to the hexagonal hole, said lubricating duct having a first diameter; and,

a lubrication supply port to which a lubrication apparatus can be attached, formed in the hexagonal hole of said end surface of said stud that connects with said lubricating duct extending from said hexagonal hole;

wherein said lubrication supply port has a second diameter within said track portion, said second diameter being constant until a position wherein said lubrication supply port meets said lubricating duct past a location wherein said lubricating hole is disposed, at which said second diameter decreases to said first diameter of said lubricating duct.

6,015,238

ROLLING BEARING FOR ROTARY MOVEMENTS

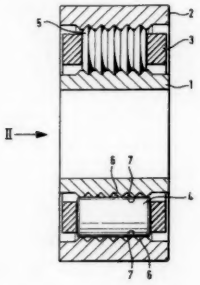
Alexander Zernickel, Herzogenaurach, Germany, assignor to INA Walzlager Schaeffler oHG, Germany

Filed Jul. 20, 1998, Appl. No. 119,433

Claims priority, application Germany, Aug. 7, 1997, 197 34 134

Int. Cl.[7] F16C *33/36*

U.S. Cl. 384—565 **4 Claims**



1. A rolling bearing for rotary movements comprising an inner bearing ring, an outer bearing ring (**2**, **13**, **16**) and rolling elements configured as rollers and arranged between said inner and outer bearing rings for permitting a transmission of radial and axial forces from one of said bearing rings to other of said bearing rings, characterized in that the rollers form two different groups, the rollers of a first group being configured as cylindrical rollers having a circular cylindrical outer peripheral surface, while the rollers of a second group are configured as profiled rollers having an outer peripheral surface comprising circular grooves arranged axially behind one another wherein the cylindrical rollers and the profiled rollers are arranged in alternating sequence in a single circumferential row in the bearing.

6,015,239

PASSIVELY ALIGNED OPTO-ELECTRONIC COUPLING ASSEMBLY

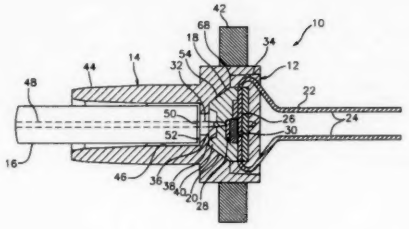
Andrew J. Moore, Broomfield, Colo., assignor to Cielo Communications, Inc., Broomfield, Colo.

Filed Apr. 20, 1998, Appl. No. 63,122

Int. Cl.[7] G02B *6/255*

U.S. Cl. 385—92 **25 Claims**

1. An opto-electronic coupling assembly for optically coupling a light active area of an active device with an end face at one end of



an elongated light guide such that light is coupled between the end face of the light guide and the light active area of the active device, said coupling assembly comprising:

a) a light guide end housing defining a housing outline and adapted to support the end of said light guide including said end face;

b) an active device package including

i) an arrangement for supporting said active device and for providing external electrical connections to the active device, and

ii) an encapsulant material surrounding said active device and at least partially surrounding said support arrangement, said encapsulant material being substantially optically transparent to the coupled light and said encapsulant material being molded in a predetermined configuration which cooperates with the housing outline of the light guide end housing in a way that passively places the light active area of the active device into substantial optical alignment with the end face of the light guide when the light guide end housing is assembled with the active device package.

6,015,240

TRANSFER TYPE IMAGE PROTECTING FILM AND METHOD OF PRODUCING THE SAME

Motohiro Mizumachi; Satoru Shinohara, and Kenichi Saito, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of application No. 08/896,073, Jul. 17, 1997, Pat. No. 5,789,067, which is a continuation-in-part of application No. 08/615,780, Mar. 14, 1996, abandoned. This application Apr. 6, 1998, Appl. No. 55,761.

Claims priority, application Japan, Jun. 2, 1995, P07-159972

Int. Cl.[7] B41J *31/09*

U.S. Cl. 400—241 **10 Claims**

1. An ink ribbon comprising:

a base film,

an ultraviolet absorbing layer disposed on a top surface of the base film, the ultraviolet absorbing layer comprising an ultraviolet absorbing material suspended in a thermoplastic resin, the ultraviolet absorbing material being selected from the group consisting of benzophenone and benzotriazole, the thermoplastic resin being selected from the group consisting of cellulose acetate butyrate resins and polyvinyl butyral resins,

a surface adhesive layer disposed on a top surface of the ultraviolet absorbing layer, the surface adhesive layer comprising a resin selected from the group consisting of cellulose acetate butyrate resins, polyvinyl butyral resins, polyester resins, the surface adhesive layer being free of ultraviolet absorbing material.

6,015,241

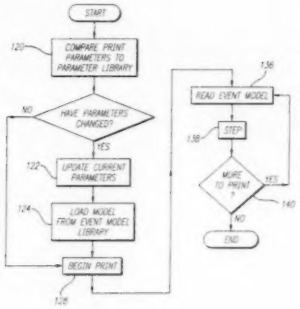
PRINTER FEEDBACK CONTROL AND EVENT LIBRARY TO COMPENSATE FOR AND PREDICT VARIABLE PAYOUT FORCES

Christopher A. Wiklof, Everett, and Pixie A. Austin, Marysville, both of Wash., assignors to Intermec IP Corp., Woodland Hills, Calif.

Continuation-in-part of application No. 08/467,210, Jun. 6, 1995. This application Dec. 18, 1997, Appl. No. 999,384.

Int. Cl.[7] **B41J** *13/00*

U.S. Cl. 400—578 **25 Claims**



1. An apparatus for use in a thermal printer having a print head for printing information onto a paper substrate material, said paper substrate material having a transport rate that is affected by a payout force as it is transported through the thermal printer, said apparatus comprising:

a transporting mechanism for transporting said paper substrate material through a print region of said thermal printer;

a central processor;

a random access memory storing data for predicting periodic variations in said payout force affecting said transport rate; and

a program memory storing program instructions for controlling said processor, said program instructions being operative with said processor for reading said data from said random access memory, for generating a driving signal for said transporting mechanism, and for generating a printing signal for said print head;

wherein said transport rate of said paper substrate material through said print region is synchronized with said print head.

6,015,242

SOAP HOLDING SCRUB PUFF

Christopher S. Gillis, 75 East Franklin St., Shavertown, Pa. 18708

Filed Jun. 8, 1999, Appl. No. 327,574

Int. Cl.[7] **A47K** *5/04;5/08*

U.S. Cl. 401—201 **6 Claims**

1. A scrub article comprising inner tubular open mesh net, soap means contained within said inner tubular net, said inner tubular net having a diameter smaller than the size of said soap means so as to tightly retain said soap means therewithin, an outer tubular open mesh net having a diameter greater than the size of said soap means so that said inner tubular net fits within said outer tubular net, said outer tubular net having a length sufficient to enable it to be gathered longitudinally along said first tubular net and said soap means, said inner and outer tubular nets being folded longitudinally about themselves to form a puff around said soap means, the

end portions of said inner tubular net adjacent said soap means being fastened together to retain said soap means in place.

6,015,243

CONCRETE MATERIAL PAVING STONE

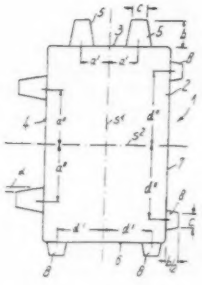
Peter Geiger, Regensburger Strasse 160, Neumarkt, Germany, D-92318

PCT No. PCT/EP97/00041, § 371 Date Sep. 8, 1998, § 102(e) Date Sep. 8, 1998, PCT Pub. No. WO98/30754, PCT Pub. Date Jul. 16, 1998

PCT Filed Jan. 8, 1997, Appl. No. 142,436

Int. Cl.[7] **E01C** *5/06*

U.S. Cl. 404—38 **4 Claims**



1. A paving stone made of concrete material comprising:

a) a rectangular body having a flat top side, a first set of opposite spaced side surfaces comprising a first side and a third side, said first and third sides each having a first length and a first symmetry line s^1 bisecting said first and third sides and a second set of opposite spaced sides comprising a second side and a fourth side having a second length and a second symmetry line s^2 bisecting these sides;

b) a first set of trapezoidal shaped support attachments having a width "b" extending out from said first side and said second side surfaces; and

c) a second set of trapezoidal shaped support attachments having a width "b/2" extending out from said third side and said fourth side surfaces;

wherein said support attachments are arranged symmetrically on said sides spaced equidistant from said symmetry lines s^1 and s^2 so that said attachments are butt staggered or butt-jointed

with adjacent paving stones so that said support attachments form adjacent side surfaces when said paving stones are placed together.

6,015,244

WIND DIRECTING SEA WALL

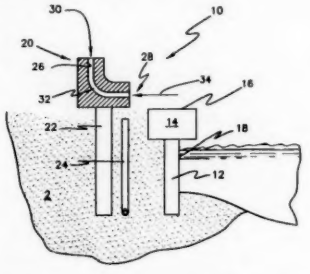
Raymond Wells, Mayo, Fla., assignor to Storm Diverter Corporation, Oakbrook Terrace, Ill.

Continuation of application No. 08/941,481, Oct. 1, 1997, abandoned. This application Sep. 28, 1998, Appl. No. 162,042.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **E02B** *3/04;3/06;* **E01F** *7/02*

U.S. Cl. 405—22 **3 Claims**



1. A wind directing water dissipating unit adapted to be positioned adjacent to and above a sea wall barrier on a body of water, said unit comprising:

a water facing wall and an upward facing wall;

a plurality of wind directing passages in said unit, each said passage including an inlet passing through said water facing wall and an outlet passing through said upward facing wall where each said wind directing passage has a diminishing cross section from said inlet to said outlet such that air entering each said inlet of a passage is redirected and accelerated as the air is discharged from said outlet of said passage;

said inlets on said water facing wall being located above the normal surface of the body of water to prevent blockage of said inlets by the water, so that during stormy-windy conditions, air entering and passing through said passages creates a generally vertical air curtain above said upward facing wall;

whereby any air-borne water lifted and driven over said unit is dissipated by said air curtain.

6,015,245

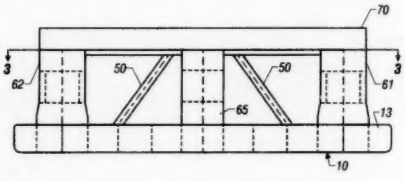
SEMISUBMERSIBLE OFFSHORE VESSEL

Fernando C. Frimm; Harris I. Knecht, and Thomas D. Condon, all of 11511 Katy Freeway, Suite 200, Houston, Tex. 77079

Filed Sep. 8, 1997, Appl. No. 925,506

Int. Cl.[7] **B63B** *35/40;35/34;35/44*

U.S. Cl. 405—200 **23 Claims**



1. A semisubmersible vessel comprising:

(a) a superstructure deck;

(b) a ring pontoon having forward, aft, starboard, and port sections;

(c) said superstructure deck is supported by at least four columns located near the forward and aft ends of the starboard and port sections of the ring pontoon; and

(d) the vertical centerline of each of the columns is located inward of both the axial centerline of the forward section of the ring pontoon and the axial centerline of the aft section of the ring pontoon.

6,015,246

TRANSPARENT PNEUMATIC TUBE CARRIER WITH TRANSPARENT ELASTIC HOLDING FILMS

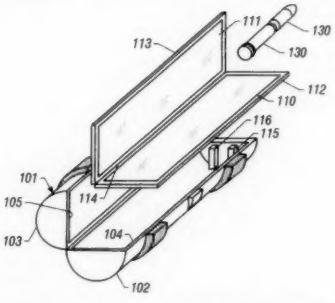
Kiyoshi Yamane; Shigeru Kiriyama, and Shizuo Higuchi, all of Miyagi, Japan, assignors to Nippon Shooter Ltd., Tokyo, Japan

Filed Sep. 11, 1996, Appl. No. 712,475

Claims priority, application Japan, Sep. 12, 1995, 7-259273

Int. Cl.[7] **B65G** *51/06*

U.S. Cl. 406—184 **12 Claims**



9. A pneumatic tube carrier for containing at least one article and conveying said at least one article through a pneumatic tube, the pneumatic tube carrier comprising:

a container body for carrying said at least one article; and

an elastic film provided in the container body with a periphery thereof held by the container body, the elastic film being adapted to be stretched by said at least one article placed in the container body.

6,015,247

ARTICLE ASSEMBLY AND ALIGNMENT MACHINE AND METHOD

Vincent E. Branaman, 13907 E. 253rd St., Peculiar, Mo. 64075

Filed Dec. 17, 1997, Appl. No. 992,451

Int. Cl.[7] **B23B** *35/00;41/00*

U.S. Cl. 408—1 R **13 Claims**

7. A method of assembling and aligning a drawer unit having a box with a drawer box front panel, a drawer box open top and a drawer front, which includes the steps of:

a) providing a work surface;

b) supporting said work surface on a base frame;

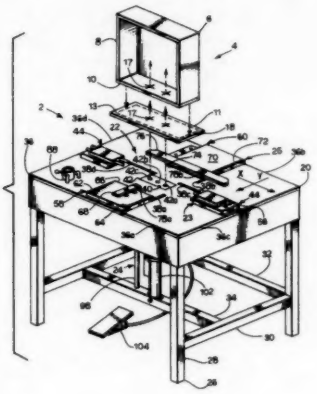
c) placing said drawer front face down on said work surface;

d) placing said drawer box on said work surface with said box front panel engaging said drawer front;

e) providing an X-axis pair of clamp assemblies mounted on said work surface for sliding between a disengaged position and an engaged position engaging said drawer;

f) synchronously biasing said clamp assemblies inwardly on said work surface into engagement with said drawer face and said drawer box;

g) providing a pair of Y-axis clamp assemblies mounted on said work surface for sliding between a disengaged position and an engaged position engaging said drawer;



h) providing an exposed perimeter of said drawer front surrounding said box front panel and forming a reveal;
i) providing each said clamp assembly with an overhanging lip;
j) engaging said drawer front perimeter with said overhanging lip to capture said drawer front;
k) providing a gang drill with multiple drill arbors below said work surface;
l) providing a plurality of drill passages in said work surface, each said passage being located over a respective drill arbor;
m) mounting a predetermined number of drill bits in said drill arbors;
n) raising said drill from a lower, disengaged position below said work surface to a raised, engaged position and drilling aligned screw holes in said drawer box front and said front panel;
o) mechanically fastening said box front panel to said drawer front from inside said drawer box with said drawer unit located on said work surface;
p) placing a handle on said drawer front panel; and
q) inserting a screw through said aligned drill holes from inside said drawer box and into said drawer handle.

6,015,248

WOOD CORER DEVICE

Terrence Charles Elliott, Carisbrook; Gary John Nevill, Ballarat; Ian Kenneth Byrne, Maryborough; Anthony Mason Adams, Maryborough; M Lyle Courtney, Maryborough, and David Spencer, Campbell, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

PCT No. PCT/AU96/00587, § 371 Date Sep. 1, 1998, § 102(e) Date Sep. 1, 1998, PCT Pub. No. WO97/11346, PCT Pub. Date Mar. 27, 1997

PCT Filed Sep. 19, 1996, Appl. No. 43,289

Claims priority, application Australia, Sep. 19, 1995, PN 5525

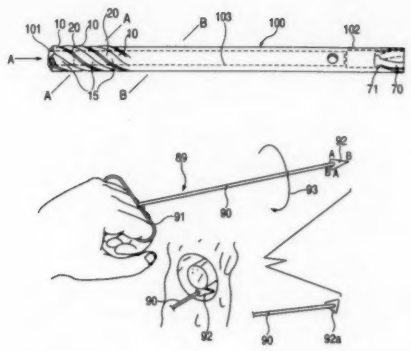
Int. Cl.[7] G01N *1/08;* **B23B** *51/04*

U.S. Cl. 408—204 **18 Claims**

1. A wood coring drill bit comprising:

a hollow tube having an internal bore and an exterior with three equally spaced bodies of substantially uniform width extending in a helical manner from a cutting end of said drill bit, said bodies defining three equally spaced flutes between the edges of adjacent bodies, each body comprising

a land upstanding from a relief at the leading edge of the body, a respective cutting face having an included angle which is within the range of 106° to 131° and associated lip being formed at the end of each body at said cutting end, said lip having a lip clearance angle that is approximately 6°±°1;



wherein the lands on the bodies extend for an axial distance of about 65 mm±5 mm from said cutting end and the internal bore of the hollow tube is tapered outwardly from or adjacent the cutting end.

18. A wood coring kit comprising:

I. a wood coring drill bit including:

A. a hollow tube having an internal bore and an exterior with three equally spaced bodies of substantially uniform width extending in a helical manner from a cutting end of said drill bit, said bodies defining three equally spaced flutes between the edges of adjacent bodies, each body comprising a land upstanding from a relief at the leading edge of the body, a respective cutting face having an included angle which is with the range of 106° to 131° and associated lip being formed at the end of each body at said cutting end, said lip having a lip clearance angle that is approximately 6°±°1;

B. wherein the lands on the bodies extend for an axial distance of about 65 mm±5 mm from said cutting end and the internal bore of the hollow tube is tapered outwardly from or adjacent the cutting end; and

II. a core extraction device for extracting a core located in a cavity in a piece of wood excavated by said coring drill bit, wherein said core extraction device has a shaped cutting end and a handle at an opposite end thereof, said cutting end and said handle are joined by a elongate shaft whereby said cutting end is positioned towards the end of the excavated cavity formed by said coring bit and the handle which is exterior of the cavity is rotated to cut the shank of the core located within the cavity.

6,015,249

DEVICE AND METHOD FOR CONTROLLING THE MACHINING DEPTH OF A MACHINE FOR MACHINING MULTILAYER PRINTED CIRCUIT BOARDS

Gentile Sacchetti, Lessolo, Italy, assignor to Pluritec Italia S.p.A., Via Torrione, Italy

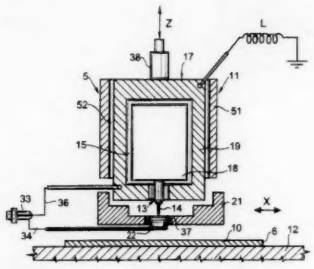
Filed May 15, 1997, Appl. No. 856,793

Claims priority, application Italy, May 17, 1996, TO96A0415

Int. Cl.[7] B23Q *15/00*

U.S. Cl. 409—186 **16 Claims**

1. A device for controlling the machining depth of a machine for machining multilayer printed circuit boards, comprising an operating head (**11**) movable by an electronic unit (**16**) with respect to a board (**6**) to be machined; said head (**11**) comprising a board holder device (**21**), and an electric motor (**17**) for a tool spindle (**13**); said electric motor (**17**) comprising a rotor (**18**) integrated with said spindle (**13**), and a stator (**19**) fitted to said head (**11**) and movable axially towards said board (**6**); air-cushion supporting means (**53**, **54**) being provided between said rotor (**18**) and said stator (**19**); and further comprising a generator (**24**) for generating electric signals at a predetermined operating frequency and for sensing



contact of a tool (**14**) on said spindle (**13**) with a conducting layer (**9**) of said board (**6**) to define a machining depth reference dimension, said stator (**19**) being connected electrically to said head (**11**) by an inductor (L) for insulating the stator (**19**) from said head (**11**) at least at said operating frequency; and enabling means (**26**) for so conditioning said control unit (**16**) as to feed said stator (**19**) to a predetermined depth (K) departing from said reference dimension so defined.

6,015,250

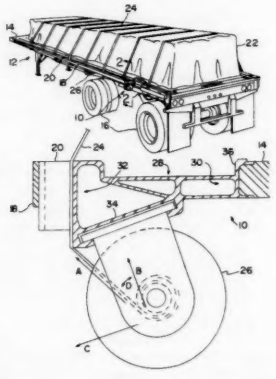
CARGO RESTRAINT ATTACHMENT ASSEMBLY

Martin Walsh, and Brian Adkins, both of Savannah, Ga., assignors to Great Dane Limited Partnership, Chicago, Ill.

Continuation of application No. 08/925,978, Sep. 9, 1997, Pat. No. 5,888,040. This application Dec. 8, 1998, Appl. No. 207,439.

Int. Cl.[7] **B60P** *7/08*

U.S. Cl. 410—100 **9 Claims**



1. A platform trailer, said platform trailer comprising:

a load carrying main frame;

an elongated loading deck supported by said main frame and defining a generally planar surface upon which cargo may be loaded; and

an elongated side rail attached to at least one of said loading deck and said main frame so that said side rail is disposed along a longitudinal edge of the trailer, said side rail defining an upwardly opening channel extending along said longitudinal edge, said channel having

a planar central portion substantially parallel to a first plane defined by an upper horizontal surface of said loading deck, said planar central portion disposed between said first plane and a second plane defined by a lower horizontal surface of said loading deck, and

opposing flat side portions extending vertically upward from said central portion to said first plane so that said channel is open from said first plane to said planar central portion.

6,015,251

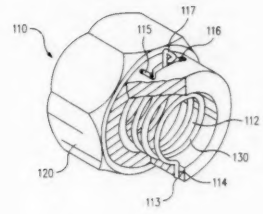
SECURE THREADED FASTENER

Boo Kang Chung, Junghoa-Dong 286-37, Junglang-gu, Seoul, Rep. of Korea

Filed Feb. 19, 1998, Appl. No. 26,028

Int. Cl.[7] **F16B** *37/12;35/02*

U.S. Cl. 411—252 **5 Claims**



1. A secure threaded fastener, comprising:

a nut provided with an internally threaded hole, said internally threaded hole having a smooth section free from any internal thread, said smooth section having a diameter equal to or larger than a major diameter of said nut; and

a coil spring radially and outwardly bent at both ends and fitted over said smooth section, with one end of the spring being caught by a fixing slot of a nut's body, thus forming a fixed end of the spring, and the other end of the spring being movably received in a guide slit of the nut's body, thus forming a movable end of the spring, wherein a hook slit is provided at the guide slit of the nut's body for selectively hooking or releasing the movable end of the spring, thus allowing the position of the nut to be selectively changed between a secured position and a loosenable position.

6,015,252

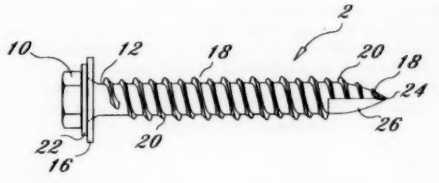
SELF-TAPPING SCREW WITH IMPROVED CUTTING POINT

Philip D. Peck, 1524 Meadow Trail, South Bend, Ind. 46614

Filed Feb. 18, 1999, Appl. No. 252,577

Int. Cl.[7] **F16B** *25/00;35/04*

U.S. Cl. 411—387.1 **17 Claims**



1. A self-tapping screw with improved cutting point comprising:

a head;

a screw body extending from said head, said screw body forming a point at an end opposite said head;

a first thread being formed around said screw body from substantially said head to a tip, said first thread turning to become substantially parallel to a length of said screw body at substantially said tip;

a second thread having the same pitch as said first thread, said second thread being formed between said first thread, said second thread turning to become substantially parallel to the length of said screw body at substantially said tip and;

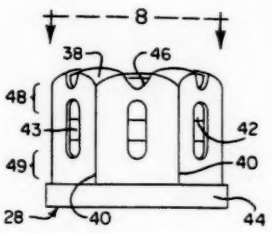
a notch being formed at substantially said tip of said screw body, said notch improving the deburring and drilling ability of said self-tapping screw.

6,015,253

MULTIPLE WASHER NUT AND METHOD OF MAKING

Richard K. Mitts, Fullerton, Calif., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Nov. 25, 1998, Appl. No. 199,547
Int. Cl.[7] F16B *37/08;39/02*
U.S. Cl. 411—432 10 Claims



1. A cage for being received about a stack of washers to form a unitary nut having a given plurality of flat sides with adjacent sides being separated by a corner, comprising:

a one-piece hollow tubular metal body having a central bore of such dimensions and geometry as to receive he washer stack therein with the bore wall conformingly contacting the flat sides of the washers and a first end of the body being formed to reduce the bore cross-section so as to obstruct removal of the stack via said body first end;

at least one opening in a sidewall of the body spaced from both the body first and second ends sufficiently so as not to expose an outermost washer edge at said second end while exposing edges of several other washers and leaving an imperforate band of the body between said one opening and said second end extending continuously in a closed path about the central bore; and

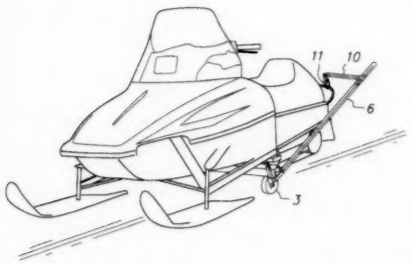
a plurality of tabs integral with the body and extending outwardly from the body second end onto the topmost washer of the stack.

6,015,254

SNOWMOBILE LIFT CART, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Michael E. Keeler, 10063 W. Jackson Rd., Riverdale, Mich. 48877-9725

Filed Dec. 19, 1995, Appl. No. 575,125
Int. Cl.[7] B62B *1/00*
U.S. Cl. 414—447 24 Claims



21. A device for lifting and transporting a snowmobile, comprising:

an elongated support member for substantially horizontal placement below a snowmobile and supportively contacting an underside of said snowmobile, said support member having opposed first and second ends;

a spacer member removably connectable to said support member for selectively spacing said support member upwardly away from a substrate when said device is in a working position thereof;

lever means operably connectable to said support member for rotating said support member between a resting position and a working postition where said support member is in a raised position;

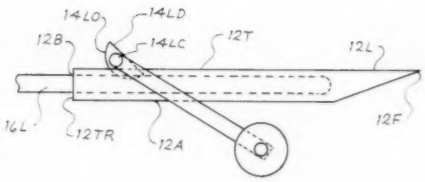
wherein said device is substantially L-shaped when said lever means is operably connected to said support member, to allow slidable lateral insertion of a free end of said support member beneath said snowmobile, from a position at a side thereof.

6,015,255

SELF LOCKING FORKLIFT ATTACHMENT

Brett Vander Meer, 10757 Meadow La., Palos Hills, Ill. 60456

Filed Sep. 3, 1998, Appl. No. 146,714
Int. Cl.[7] B66F *9/18*
U.S. Cl. 414—607 9 Claims



1. A first self locking forklift attachment (**110**) comprising:

A) an attachment (**12**) which comprises an attachment front (**12**F), an attachment left side (**12**L) having an attachment left side forklift slot (**12**LA) therein, an attachment right side (**12**R) having an attachment right side forklift slot (**12**RA) therein, an attachment back (**12**B), an attachment bottom (**12**A), and an attachment top (**12**T) having an attachment top left opening (**12**TL) and an attachment top right opening (**12**TR), the attachment left side forklift slot (**12**LA) and the attachment right side forklift slot (**12**RA) having openings at the attachment bottom (**12**B) wherein a forklift left tong (**16**L) and forklift right tong (**16**R) are inserted, respectively;

B) a left locking arm (**14**LA) comprises a left locking weight (**14**LB) securely mounted at an outer distal end, the left locking arm (**14**LA) is securely attached at an inner distal end to a left distal end of a left locking shaft (**14**LC) which is rotatably mounted within a left locking inner bracket (**14**LI) and a left locking outer bracket (**14**LO), a left locking brake (**14**LD) is securely mounted on the left locking shaft (**14**LC) between the left locking inner bracket (**14**LI) and the left locking outer bracket (**14**LO) over the attachment top left opening (**12**TL); and

C) a right locking arm (**14**RA) comprises a right locking weight (**14**RB) securely mounted at an outer distal end, the right locking arm (**14**RA) is securely attached at an inner distal end to a right distal end of a right locking shaft (**14**RC) which is rotatably mounted within a right locking inner bracket (**14**RI) and a right locking outer bracket (**14**RO), a right locking brake (**14**RD) is securely mounted on the right locking shaft (**14**RC) between the right locking inner bracket (**14**RI) and the right locking outer bracket (**14**RO) over the attachment top right opening (**12**TR), when a user inserts the forklift left tong (**16**L) into the attachment left side forklift slot (**12**LA) and inserts the forklift right tong (**16**R) into the attachment right side forklift slot (**12**RA) and lifts, the left locking weight (**14**LB) drops down rotating the left locking arm (**14**LA) engaging the left locking brake (**14**LD) against the forklift left tong (**16**L) and concurrently, the right locking weight (**14**RB) drops down rotating the right locking arm (**14**RA) engaging the right locking brake (**14**RD) against the forklift tong (**16**R).

6,015,256

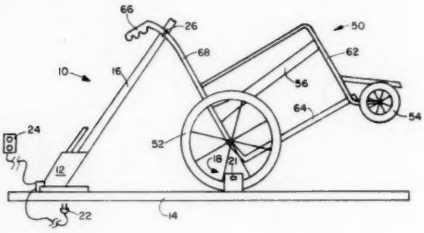
WHEELCHAIR TILTING DEVICE AND METHOD OF TILTING A WHEELCHAIR

Carlos Mesa, and Maritza Mesa, both of P.O. Box 1405, Pearland, Tex. 77588

Filed Jan. 15, 1999, Appl. No. 232,435

Int. Cl.[7] **A61G** *7/010*

U.S. Cl. 414—678 **17 Claims**



1. A device for pivoting a wheel chair, the wheel chair including a rear wheel, a wheel axle, and a handle frame having a handle, the device comprising:

a. at least one rear wheel immobilizer for securing at least one rear wheel of the wheel chair to form an immobilized rear wheel chair wheel;

b. a tilting assembly including at least one securing member for receiving a portion of the handle frame of the wheel chair; and

c. a drive mechanism attached to the tilting assembly for extending and retracting the tilting assembly;

where when the handle frame of the wheel chair is secured into the tilting assembly, the immobilized rear wheel chair wheel acts as a pivot point such that when the tilting assembly is retracted the wheel chair pivots backwards on the wheel axle to a reclining position and when the tilting assembly is extended the wheel chair returns on the axle to an upright position.

6,015,257

DEVICE FOR FORMING A STACK ON A TRANSPORT TABLE

Ernst August Hahne, Allschwil, Switzerland, and Hermann Kunzig, Weil am Rein, Germany, assignors to Eltexelektrostatik GmbH, Weil Am Rhein, Germany

PCT No. PCT/EP95/03939, § 371 Date Oct. 20, 1997, § 102(e) Date Oct. 20, 1997, PCT Pub. No. WO96/33119, PCT Pub. Date Oct. 24, 1996

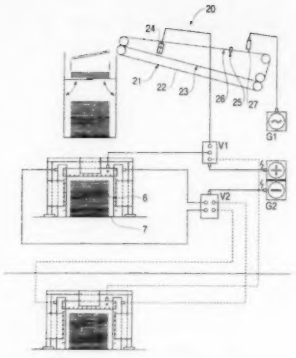
PCT Filed Oct. 5, 1995, Appl. No. 945,043

Claims priority, application Germany, Apr. 19, 1995, 195 14 405

Int. Cl.[7] **B65H** *31/34*

U.S. Cl. 414—788 **10 Claims**

1. Device for forming a stack (**6**) of objects to be transported further on a table (**7**) in a transport direction (**8**), said objects being stacked newspapers, magazines, or other stackable paper products, with the stack being transported further to another workstation, Characterized in that a blocking device is provided for a stack (**6**) to pass through, whereby the blocking device has at least one charging electrode (**11***a*, **11***b*, **12***a*, **12***b*) for locating on each side in transport of a transported stack whereby the blocking device is for providing a more stable stack, further characterized in that a charging device is located upstream of said blocking device,



whereby the charging device is for electrostatic charging of each object before it reaches the stack.

6,015,258

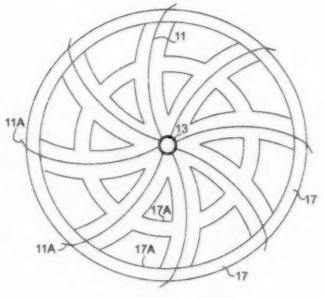
WIND TURBINE

Ronald J. Taylor, 1169 Long Valley Dr., Cheyenne, Wyo. 82001

Filed Apr. 17, 1998, Appl. No. 61,508

Int. Cl.[7] **F03D** *3/04;7/00*

U.S. Cl. 415—4.4 **16 Claims**



1. Wind turbine apparatus comprising:

(a) a rotatable central shaft member;

(b) a plurality of rotor blades each having inner and outer edges and upper and lower ends; wherein said inner edges are attached to said shaft member; and wherein each said outer edge is angled away from the direction of rotation of said central shaft member;

(c) a plurality of airfoils spaced around the periphery of said rotor blades, wherein each said airfoil has a convex cross-section and a cross-sectional length-to-width ratio in the range of about 8–12:1; and

(d) gussets extending between adjacent rotor blades in horizontal planes and positioned between said upper and lower ends; wherein said gussets include openings;

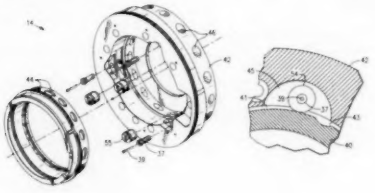
and wherein the ratio of the number of rotor blades to the number of said airfoils is at least 1.25 to 1.

6,015,259

SUPPORT MECHANISM OF INNER RING FOR VARIABLE PIPE DIFFUSER

Vishnu M. Sishtla, Cicero, and Kenneth A. Wright, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 6, 1997, Appl. No. 907,064
Int. Cl.[7] F04D *29/46*
U.S. Cl. 415—166 **11 Claims**



9. A centrifugal compressor having an annular radially disposed split ring diffuser, the diffuser including an inner ring, an outer ring, and a ring support system comprising:

at least three axle shafts;

at least three roller bearings rotatably mounted to the axle shafts;

the inner ring having an outside diameter surface, the outside diameter surface having a groove adapted to receive the roller bearings;

the outer ring having an outer annular groove disposed therein and adapted to receive the roller bearings and corresponding to the groove in the inner ring;

the at least three axle shafts and roller bearings circumferentially disposed in the outer ring such that the roller bearings are positioned to collectively define an inner diameter substantially equal to that of the inside surface of the inner groove of the cylindrical member; and

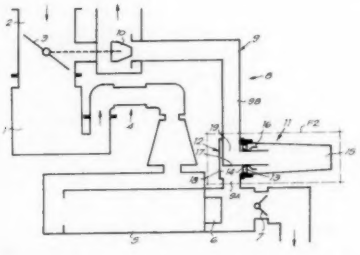
the inner ring positioned within the at least three roller bearings such that the outside diameter surface is disposed in rolling contact with the roller bearings wherein an upper surface of the inner ring includes at least three scalloped areas disposed therein corresponding to the roller bearing locations to facilitate installation of the roller bearings within the inner ring.

6,015,260

BLOW-OFF DEVICE OF A COMPRESSOR UNIT AND MOISTURE SEPARATOR USED THEREBY

Marc Leopold Karel Maria Marichal, Aartselaar, Belgium, assignor to Atlas Copco Airpower, naamloze vennootschap, Belgium

Filed Mar. 25, 1998, Appl. No. 47,376
Claims priority, application Belgium, Mar. 25, 1997, 9700263
Int. Cl.[7] F01B *31/18*
U.S. Cl. 415—169.002 **12 Claims**



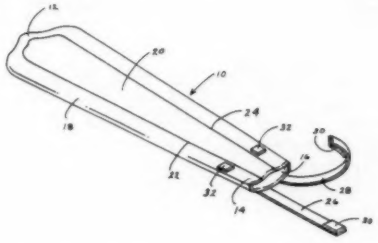
1. A blow-off device of a compressor unit, which compressor unit is of the type comprising a compressor to which an outlet conduit is connected with therein a cooler with a moisture separator and a return valve, whereby the blow-off device comprises a blow-off conduit which, on one hand, is connected to the outlet conduit between the cooler and the return valve and, on the other hand, gives out into the atmosphere, a blow-off valve which is arranged in this blow-off conduit, and a moisture separator which is placed in the blow-off conduit between the outlet conduit and the blow-off valve and comprises means for subjecting the blown-off fluid to a turbulence, such that moisture is separated.

6,015,261

CEILING FAN BLADE COVER

Connie Barone, 1453 Carlos Way, Upland, Calif. 91786

Filed Jun. 2, 1998, Appl. No. 88,035
Int. Cl.[7] F04D *29/00;29/70*
U.S. Cl. 416—62 **5 Claims**



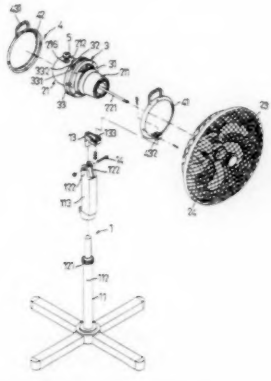
1. A cover for a fan blade comprising a substantially tubular sleeve formed from a first material having substantially oppositely disposed ends and a second material having elastic properties, said second material substantially joining together said substantially oppositely disposed ends of said first material, said substantially tubular sleeve having a first end which is substantially closed and an oppositely disposed second end which is open and having a tapered configuration from said first end to said second end resulting in said first end being larger than said second end and means for attaching said cover to a fan blade.

6,015,262

ELECTRIC FAN APPARATUS CAPABLE OF BLOWING AIR IN A DESIRED ORIENTATION

Kuo-Cheng Huang, No. 17, Hsin-Ren Rd., Tainan, Taiwan

Filed Oct. 21, 1997, Appl. No. 955,129
Int. Cl.[7] F01D *25/00*
U.S. Cl. 416—100 **8 Claims**



1. An electric fan apparatus, comprising:

a housing having a front part and a rear part which extend in a longitudinal direction;

a driving motor disposed in said housing and provided with an output spindle, said output spindle having a front end portion extending outwardly of said front part, and a rear end portion provided with a worm section which extends into said rear part;

a pair of swivel joints respectively disposed on an outer circumference of said front part and diametrically opposite to each other in a transverse direction relative to said longitudinal direction;

an inner annular member sleeved on said outer circumference of said front part, and fixedly connected to said swivel joints at opposite sides of said outer circumference so as to swivel relative to said outer circumference;

an outer annular member sleeved retainingly on said inner annular member in such a manner that said inner annular member is angularly adjustable relative to said outer annular member;

a swing rod disposed in said rear part of said housing, said swing rod having a first proximate end relative to said worm section and mounted pivotally on said rear part, and a first distal end extending towards said front part;

a drive transmission member disposed in said rear part to transmit an axial rotation of said worm section to swing said first distal end of said swing rod relative to said first proximate end in a plane parallel to said worm section;

an anchoring member having a second proximate end pivotally mounted on said inner annular member and a second distal end fixedly anchoring said first distal end of said swing rod to arrest movement of said second distal end, thereby driving said first proximate end as well as said rear part to swing around said swivel joints;

an upright stand having an upper end connected fixedly to an outer periphery of said outer annular member; and

an impeller fixedly mounted on said front end portion of said output spindle and rotated by said driving motor.

6,015,263

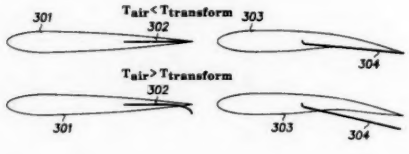
FLUID MOVING DEVICE AND ASSOCIATED METHOD

Garron Morris, Evanston, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1998, Appl. No. 52,681

Int. Cl.[7] B63H *1/26*

U.S. Cl. 416—132 A **9 Claims**



1. A fluid moving device, comprising:

a rotatable assembly;

a plurality of fan blades disposed circumferentially around and extending outward from said rotatable assembly, wherein at least one of said plurality of fan blades comprises a tail piece coupled at a proximity of a trailing edge of said fan blade, wherein said tail piece comprises shape memory alloy.

6,015,264

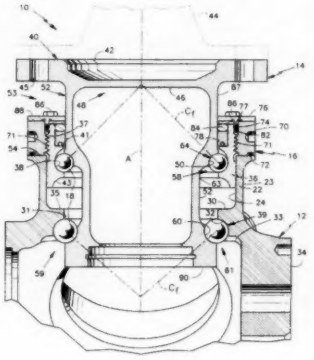
PRELOADED RETENTION ASSEMBLY FOR AIRCRAFT PROPELLER BLADE RETENTION

John A. Violette; Matthew C. Soule, both of Granby, and Thomas G. Corley, Suffield, all of Conn., assignors to United Technologies Corporation, Windsor Locks, Conn.

Filed Aug. 15, 1997, Appl. No. 912,082

Int. Cl.[7] B64C *11/06*

U.S. Cl. 416—146 A **25 Claims**



15. A propeller blade retention assembly for use with a propeller having a hub rotatable about a propeller axis, said hub defining a cavity containing a lubricating fluid, said propeller blade retention assembly comprising:

a receiving means for mounting the blade to the hub;

means for interfacing said receiving means with the hub, wherein said receiving means is positioned in said means for interfacing and is integral with the blade and non-integral with said means for interfacing and wherein said receiving means and said means for interfacing define an inboard and outboard relief area for facilitating assembly of said retention means;

a retention means for retaining said receiving means to said means for interfacing, said retention means comprising:

angular contact ball bearing assemblies for facilitating relative rotational motion between said receiving means and said means for interfacing, wherein said angular contact ball bearing assemblies include unitary, non-split races, wherein said angular contact ball bearing assemblies include an outboard ball bearing assembly including outboard rolling elements and an inboard ball bearing assembly including inboard rolling elements; and a member having a unitary outboard, non-split race defining a portion of said outboard ball bearing assembly and threads; and

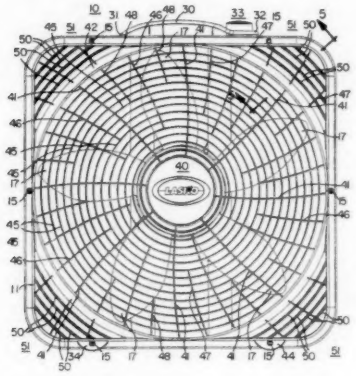
means for preloading said retention means prior to centrifugal loading during propeller blade operation, wherein said means for preloading comprises a preload nut for engagement with said threads, and wherein said member is capable of generating a retention preload when said outboard race and said outboard rolling elements are loaded against said inboard ball bearing assembly by engaging said means for preloading with said threads, said retention means further comprising at least two static seals positioned between said member and said preload nut and between said preload nut and said means for interfacing for sealing the cavity.

6,015,265

BOX FAN WITH AIR DIVIDER RING

William E. Lasko, West Chester, Pa.; Ralph Zwakenberg, Claymont, Del., and Rodney Wilson, Boothwyn, Pa., assignors to Lasko Holdings, Inc., West Chester, Pa.

Filed Aug. 31, 1998, Appl. No. 143,607
Int. Cl.[7] B63H *1/28*
U.S. Cl. 416—247 R **3 Claims**



1. A box fan which includes an open housing of square configuration, a fan motor mounted to said housing, a rotatable hub mounted to and driven by said motor, a plurality of fan blades on said hub, an open rear grill mounted to said housing and an open front grill mounted to said housing, the improvement which comprises

said front grill has a center plate,

a plurality of concentric circular ribs spaced outwardly from said center plate of increasing diameter,

a rim extending around the perimeter of said front grill,

a plurality of spaced radial ribs connecting selected concentric circular ribs and extending to said rim,

a plurality of spaced concentric circular rib lengths connecting the corners of said front grill,

an air divider ring spaced inwardly of said rib lengths connecting the corners of said front grill with selected radial ribs, connected thereto and to said rim, and

said air divider ring having a substantially greater width than said concentric circular ribs.

6,015,266

REACTIVE MATERIAL RECIPROCATING SUBMERSIBLE PUMP

Mike Allen Swatek, Claremore, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Aug. 27, 1997, Appl. No. 918,978
Int. Cl.[7] F04B *45/00*
U.S. Cl. 417—53 **10 Claims**

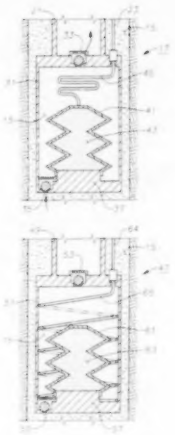
1. A pumping system comprising:

a pump having a chamber, an intake valve for admitting a fluid into the chamber, and a discharge valve for discharging the fluid from the chamber;

reactive polymer gel contained within the chamber, the gel having a first volume when exposed to an electromagnetic field and a second volume when the electromagnetic field is removed, the first volume being significantly different from the second volume;

an electromagnetic coil surrounding the gel, the coil being connected to a power supply which selectively and alternately exposes the gel to an electromagnetic field for causing the gel to expand and expel a portion of the fluid within the chamber through the discharge valve; and

a variable volume reservoir which encloses the gel; and wherein



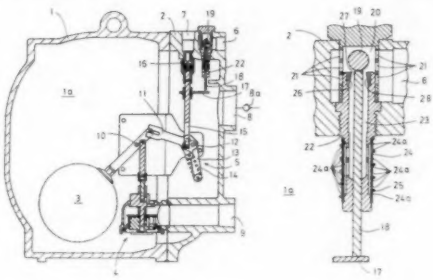
the coil is located within the chamber and surrounds the reservoir.

6,015,267

LIQUID FORCED-FEED APPARATUS HAVING A WORKING FLUID DISPERSING DEVICE

Hideaki Yumoto, Kakogawa, Japan, assignor to TLV Co., Ltd., Kakogawa, Japan

Filed Aug. 7, 1997, Appl. No. 908,391
Claims priority, application Japan, Aug. 13, 1996, 8-232578
Int. Cl.[7] F04F *1/06*
U.S. Cl. 417—54 **13 Claims**



9. A method of force feeding liquid, comprising:

providing a vessel having a working fluid inlet port, a working fluid outflow port, a liquid inflow port, and a liquid outflow port, a liquid level detecting device for detecting a liquid level of a liquid surface within the vessel and a changeover valve connected to the liquid level detecting device, the changeover valve closing the working fluid outflow port when the working fluid inlet port is opened, the changeover valve opening the working fluid outflow port when the working fluid inlet port is closed;

feeding a liquid into the vessel through the liquid inflow port to thereby provide the liquid surface;

detecting the liquid level of the liquid surface;

closing the working fluid outflow port and opening the working fluid inlet port when the liquid level is higher than a predetermined level to thereby allow a working fluid to flow into the vessel; and

dispersing the working fluid flowing from the working fluid inlet port away from the liquid surface, thereby preventing direct contact of the working fluid with the liquid surface within the

vessel when the working fluid is fed into the vessel from the working fluid inlet port.

6,015,268

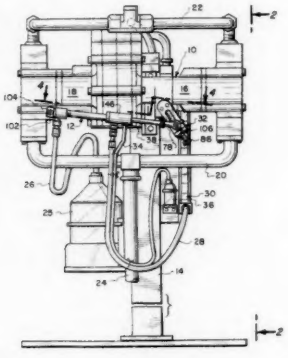
PRECISION METERED MULTIPLE FLUID PUMPING SYSTEM

Robert D. Hetherington, Sunland, Calif., assignor to Illinois Tool Works Inc., Glenview, Ill.

Division of application No. 08/424,163, Apr. 19, 1995, Pat. No. 5,522,711, which is a division of application No. 08/052,405, Apr. 22, 1993, Pat. No. 5,423,662. This application Dec. 29, 1995, Appl. No. 580,744.

Int. Cl.[7] **F04B** *43/06*

U.S. Cl. 417—63 **13 Claims**



1. A precision metering multiple fluid pumping system comprising:

main pump means for pumping a primary fluid;

auxiliary pump means for pumping a secondary fluid;

leak detecting means for visible observing and detecting leaks in seals in said auxiliary pump means for early detection of off ratio pumping of said secondary fluid to said primary fluid;

said leak detecting means comprising a container in which a fluid is visible and a drain conduit connecting said container to said auxiliary pump means adjacent said seals

connecting means connecting said auxiliary pump means to said main pump for operation in unison therewith;

said connecting means including continuously adjustable variable means for adjusting the ratio of secondary fluid to primary fluid pumped over a predetermined range;

whereby fluid leaking by said seals flows into said container providing a visible indication said seals are leaking so that the amount of secondary fluid pumped may be precisely metered.

6,015,269

VARIABLE DISPLACEMENT COMPRESSOR

Masaki Ota; Masaru Hamasaki; Masayoshi Hori; Hisakazu Kobayashi; Satoshi Koumura, and Yasunori Makino, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi-ken, Japan

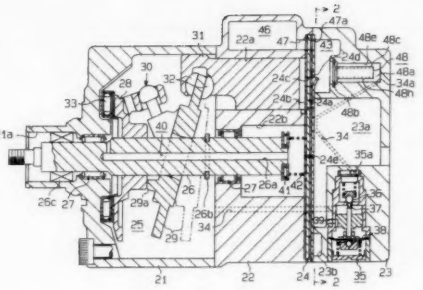
Filed Dec. 5, 1997, Appl. No. 986,115

Claims priority, application Japan, Dec. 10, 1996, 8-329828; Feb. 6, 1997, 9-024137; Sep. 24, 1997, 9-259067

Int. Cl.[7] **F04B** *1/26; 1/12*

U.S. Cl. 417—222.2 **32 Claims**

1. A variable displacement type compressor having a crank chamber defined in a housing, a drive shaft rotatably supported by a housing, a plurality of cylinder bores defined in a cylinder block to surround the drive shaft, a piston that reciprocates within the associated cylinder bore, a supply passage for communicating a



discharge area that includes a discharge chamber within the housing to the crank chamber, a discharge port associated with each cylinder bore, and a cam plate tiltably supported on the drive shaft, wherein, when each piston reciprocates, a refrigerant gas is drawn into the associated cylinder bore from a suction chamber and discharged from the associated cylinder bore to the discharge chamber via the associated discharge port, and wherein the amount of gas discharged from the bores is controlled by varying the inclination of the cam plate, the compressor comprising:

a collection compartment located in the discharge area, the collection compartment receiving the refrigerant gas discharged from the discharge ports;

an inlet of the supply passage open to the collection compartment; and

an oil separator located in the collection compartment for recovering oil from the refrigerant gas and introducing the recovered oil to the crank chamber via the supply passage.

6,015,270

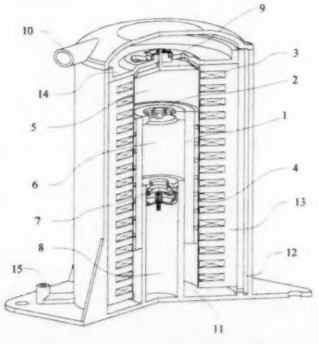
LINEAR COMPRESSOR OR PUMP WITH INTEGRAL MOTOR

Bruce A. Roth, Chandler, Ariz., assignor to Air Conditioning Technologies, Mesa, Ariz.

Provisional application No. 60/017,006, Apr. 30, 1996. This application Apr. 16, 1997, Appl. No. 834,371.

Int. Cl.[7] **F04B** *3/00*

U.S. Cl. 417—259 **12 Claims**



1. A two stage compressor with integral multiphase linear electric motor comprising:

a) a plurality of substantially similar electrically conductive drive coils axially arranged, said drive coils externally surrounded with a first magnetic flux carrying means, said drive coils together with said flux carrying means forming a hollow cylindrical motor body

b) a hollow cylindrical piston slideably positioned within said motor body, said piston furnished with a second magnetic flux carrying means integral with at least a radially outer surface thereof

c) piston closure means with a one way interstage valve provided at one end of said hollow cylindrical piston

d) a first motor body closure means with a one way intake valve provided at a first end of said motor body adjacent to said interstage valve in said piston

e) a second motor body closure means provided at a second end of said motor body adjacent to the open end of said hollow piston, said second motor body closure means provided with a salient discharge tube with a one way discharge valve extending slideably into the hollow bore of said piston

whereby, as said piston oscillates within said motor body in response to sequential electrical currents flowing in said drive coils, a working fluid is drawn into said compressor through said intake valve and is compressed and transferred through said interstage valve into the hollow center of said piston in a first stage of compression, and further is compressed and transferred out of said compressor through said discharge tube.

6,015,271

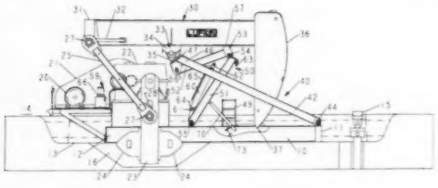
STOWABLE WALKING BEAM PUMPING UNIT

LeMoyne Boyer, Lufkin, and Robert Miler Jones, Diboll, both of Tex., assignors to Lufkin Industries, Inc., Lufkin, Tex.

Filed Oct. 14, 1998, Appl. No. 172,400

Int. Cl.[7] **F01B** *23/08*

U.S. Cl. 417—321 **14 Claims**



1. A beam pumping unit having a walking beam supported by a central bearing, a Samson post disposed to support the central bearing, a drive means connected to one end of the walking beam to oscillate the walking beam, a horsehead mounted on the other end of the walking beam and connected to the polished rod to reciprocate the polished rod, said Samson post comprising:

a pair of forward support legs, the lower end of each of said support legs being pivotally attached to the frame of the beam pumping unit, the other end of each of said support legs being secured to the central bearing of the walking beam;

a rear support leg, one end of said rear support leg being pivotally attached to the frame of the beam pumping unit, the other end of said rear support leg being pivotally attached to the central bearing of the walking beam, said rear support leg having a knee joint disposed between its ends; and

actuating means connected to said rear leg to move said knee joint between a first position in which said rear support leg is fixed in a substantially straight line and a second position in which said rear support leg is bent about said knee joint whereby said walking beam is raised to a first normal pumping position and then lowered to a second storage position.

6,015,272

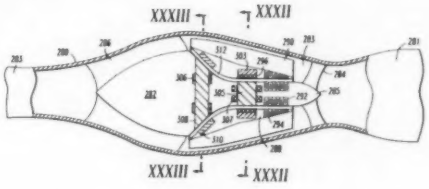
MAGNETICALLY SUSPENDED MINIATURE FLUID PUMP AND METHOD OF DESIGNING THE SAME

James F. Antaki, Allison Park, Pa.; Bradley Paden, Santa Barbara, Calif.; Gregory Burgreen, Pittsburgh, Pa., and Nelson Groom, White Marsh, Va., assignors to University of Pittsburgh, Pittsburgh, Pa., and The United States of America as represented by Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 26, 1996, Appl. No. 673,627

Int. Cl.[7] **F04B** *17/00;* **F03B** *13/00*

U.S. Cl. 417—356 **21 Claims**



1. A rotary pump for pumping fluid through a patient comprising:

(a) a housing that has an inlet, an outlet and an inner surface, at least a region of which is curved;

(b) a stator member attached to said housing comprising:

(b_1) a substantially conically shaped nose, that has a plurality of stationary blades, disposed at the inlet to define an inlet flow passage between the nose and the inner surface;

(b_2) a substantially conically shaped tail disposed at the outlet and having a plurality of stationary blades, disposed around the tail, the curved region of the inner surface conforming to the substantially conically shaped tail to define an outlet flow passage between the tail and the inner surface; and

(b_3) a mid-section disposed between the nose and the tail, the mid-section having a curved portion that connects the nose to the tail;

(c) a rotatable impeller for pumping fluid positioned within said housing and around the mid-section, the impeller comprising a hub that comprises:

(c_1) an exterior surface, about which a plurality of outboard blades are disposed, a primary flow passage being defined between the exterior surface and the curved region of the inner surface of the housing, the primary flow passage being in fluid communication with the inlet flow passage and the outlet flow passage; and

(c_2) an interior surface that is curved to conform to the curvature of the curved portion of the mid-section of the stator to define a smooth secondary flow passage that is in fluid communication with the inlet flow passage and the outlet flow passage, the primary flow passage being disposed in a divergent relationship with the outlet flow passage so that fluid diverges as the fluid flows from the primary flow passage to the outlet flow passage and thereby preventing flow recirculation, the primary flow passage being larger than the secondary flow passage, the fluid flowing through the inlet flow passage through the primary flow passage and then through either the outlet flow passage or the secondary flow passage during operation of the pump; and

(d) a first stack of magnets disposed within the impeller and aligned with a second stack of magnets disposed in the mid-section of the stator member, the first and the second stacks of magnets defining a magnetic radial bearing.

6,015,273

ELECTROMAGNETIC RECIPROCATING COMPRESSOR WITH SPRING ASSEMBLY MOUNTED AROUND PISTON

Angus Patrick Douglas Hannagan, Waterlooville, and Michael Alan McGrath, Hayling Island, both of United Kingdom, assignors to Pegasus Airwave Limited, Waterlooville, United Kingdom

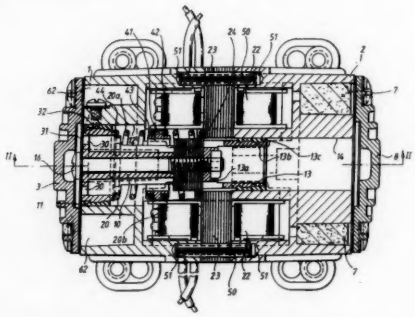
PCT No. PCT/GB95/02901, § 371 Date Jul. 10, 1997, § 102(e) Date Jul. 10, 1997, PCT Pub. No. WO96/18037, PCT Pub. Date Jun. 13, 1996

PCT Filed Dec. 8, 1995, Appl. No. 849,277

Claims priority, application United Kingdom, Dec. 8, 1994, 9424790

Int. Cl.[7] **F04B** *17/04*

U.S. Cl. 417—417 **9 Claims**



1. An electromagnetic reciprocating compressor comprising a body, a piston reciprocating in the body, and an electromagnetic drive for the piston, the piston having a piston head which slides in a cylinder in the body to effect compression of fluid in the cylinder during operation of the compressor and, axially spaced from the piston head, a piston guide member slidingly movable on a piston guide surface provided by the body, the piston carrying an armature forming part of said electromagnetic drive and said body including a lamination stack providing a stator of said electromagnetic drive; and

the compressor further comprising a compression spring arrangement comprising at least one helical compression spring acting to drive the piston axially, which said spring is mounted around the piston and is at least partly located within the cylinder during at least part of a piston stroke but is outside a working volume of fluid undergoing compression; and

wherein, for replacement or maintenance, the piston including the armature and the piston guide member is removable from the body through an end of the cylinder remote from the piston guide surface, and wherein said spring arrangement is located at one end on a mounting member which bears on said lamination stack providing said stator.

6,015,274

LOW PROFILE CEILING FAN HAVING A REMOTE CONTROL RECEIVER

Larry S. Bias, Bartlett, and Robert E. Ferguson, Memphis, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.

Filed Oct. 24, 1997, Appl. No. 957,194

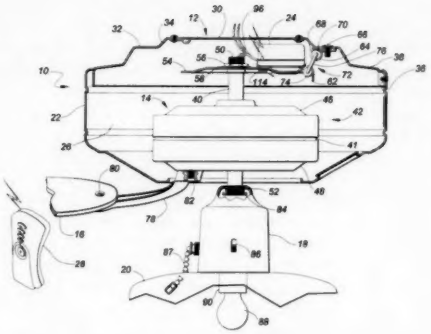
Int. Cl.[7] **F04B** *35/04*

U.S. Cl. 417—423.1 **24 Claims**

1. A remote control receiver for use in a ceiling fan having a motor, said remote control receiver comprising:

an upper housing;

a lower housing engaged with said upper housing, said upper and lower housings combining to form an interior space, said lower housing including a lower portion, a pair of opposing



end portions extending upwardly from said lower portion and a pair of opposing side portions extending upwardly from said lower portion;

attachment means for attaching said remote control receiver to a stationary portion of the ceiling fan at a position spaced apart from a rotating portion of the ceiling fan motor;

said remote control receiver being in electrical communication with the motor and operably effective for controlling a least a speed of rotation of the motor when installed in the ceiling fan;

said attachment means comprises a first plurality of apertures formed in and extending through said lower portion of said lower housing and a second plurality of apertures formed in and extending through said lower housing at a position spaced above said lower portion, each of said second plurality of apertures being aligned with and in communication with one of said first plurality of apertures.

6,015,275

MAGNETICALLY SUSPENDED CENTRIFUGAL PUMP APPARATUS WITH AN AUTOMATIC NEUTRAL POSITION SETTING CONTROL

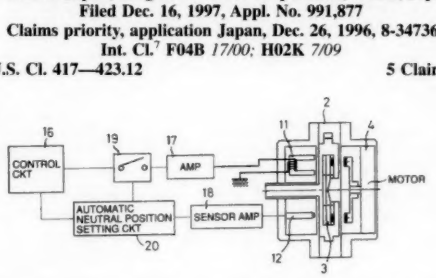
Minoru Suzuki, Shizuoka, and Toshihiko Nojiri, Kanagawa, both of Japan, assignors to NTN Corporation, Osaka, Japan

Filed Dec. 16, 1997, Appl. No. 991,877

Claims priority, application Japan, Dec. 26, 1996, 8-347369

Int. Cl.[7] **F04B** *17/00;* **H02K** *7/09*

U.S. Cl. 417—423.12 **5 Claims**



1. A magnetically suspended centrifugal pump apparatus, comprising:

a housing having a blood inlet port and a blood outlet port;

a centrifugal blood pump having an impeller rotating in said housing and feeding blood by centrifugal force caused by rotation;

a passive magnetic bearing for controlling position of said impeller; and

an active magnetic bearing including a position sensor for detecting the position of said impeller, and an electromagnet; wherein

said impeller rotates maintained at a prescribed position in said housing by function of said passive and active magnetic bearings;

said apparatus further comprising

automatic neutral position setting means for measuring an output of said sensor when said impeller is not floating before activation of said active magnetic bearing, comparing the output of said sensor with a predetermined measured value and calculating difference therebetween, for adjusting said sensor output.

6,015,276

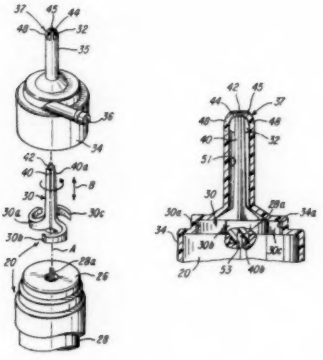
SYSTEM AND METHOD FOR REDUCING VIBRATION IN A WINDSHIELD WASHER PUMP

Richard L. Ponziani, Centerville, Ohio, assignor to Valeo, Inc., Auburn Hills, Mich.

Filed Dec. 18, 1996, Appl. No. 768,995

Int. Cl.[7] F04B *35/04*

U.S. Cl. 417—423.14 **19 Claims**



1. A washer pump for use in a window washing system comprising:

a pump motor;

an impeller having a front end of a first diameter directly coupled to an armature of said pump motor and an impeller tip of a second, reduced diameter with blades extending from said front end to said impeller tip;

said impeller tip having an outer surface;

a pump motor housing for receiving said pump motor;

an impeller housing defining a pump cavity for receiving the impeller and comprising a housing end for coupling to said pump motor housing and a tip end; and

said impeller housing and said impeller cooperating to maintain said impeller in a substantially centrally-located position in said pump cavity;

said impeller housing comprising an inner surface defining an aperture for receiving said impeller tip, with said inner surface and said outer surface forming a bearing therebetween.

6,015,277

FABRICATION METHOD FOR SEMICONDUCTOR SUBSTRATE

Hubert Richardson, Jr., Brooklyn, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 13, 1997, Appl. No. 969,379

Int. Cl.[7] F01C *1/02*

U.S. Cl. 418—55.4 **28 Claims**

1. A scroll compressor comprising:

a hermetically sealed housing;

a fixed scroll member disposed in said housing and including an involute fixed wrap element;

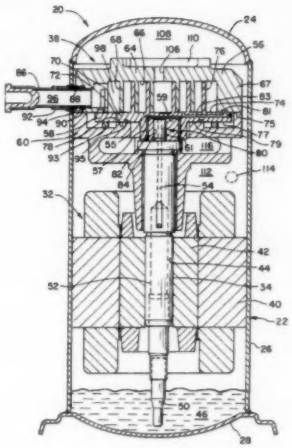
an orbiting scroll member disposed in said housing and including an involute orbiting wrap element thereon, said orbiting wrap element being intermeshed with said fixed wrap element to define therebetween at least one pocket of compression;

a drive mechanism connected to said orbiting scroll member;

an axial compliance pressure chamber containing pressurized fluid acting on one of said orbiting and fixed scroll members to urge said scroll members together;

an intermediate pressure chamber interposed between said orbiting and fixed scroll members; and

at least one passageway provided in at least one of said orbiting and fixed scroll members, said at least one passageway communicating said intermediate pressure chamber with said at least one pocket of compression during compression of fluid so as to maintain the fluid pressure within said intermediate pressure chamber at a pressure level which is intermediate between the pressure at which fluid enters said at least one pocket of compression and the pressure at which fluid is discharged from said at least one pocket of compression during compressor operation, whereby fluid from said at least one pocket of compression provides an anti-biasing force within said intermediate pressure chamber acting in a direction to axially separate said scroll members.



6,015,278

VANE MACHINE, HAVING A CONTROLLED PRESSURE ACTING ON THE VANE ENDS

Al Key, Kenesha; Gregory Lemke, Union Grove; Charles W. Meinke, Burlington, and Ronald J. Schilling, Waterford, all of Wis., assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 7, 1997, Appl. No. 910,965

Claims priority, application Germany, Aug. 8, 1996, 196 31 974

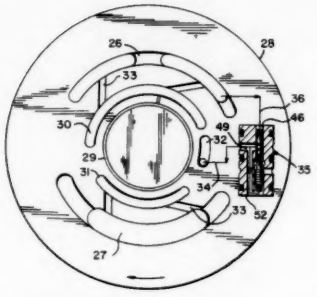
Int. Cl.[7] F01C *1/344;21/16*

U.S. Cl. 418—82 **11 Claims**

1. A vane machine comprising a housing (H) provided with an inlet connector (IC) and an outlet connector (OC) and a mechanism (**10**) accommodated in the housing; said mechanism (**10**) comprising

a rotatably mounted rotor (**12**) provided with a plurality of circumferentially distributed radial slots (**14**) defined by rotor walls (**14'**) of the rotor,

a plurality of vanes (**15**) each having a first end (**16**) and a second end (**18**) opposite the first end, each of said vanes (**15**) being guided movably in one of the radial slots (**14**) with the first end thereof inside said radial slot to form a compression chamber (**17**) therein bounded by said rotor walls, and the second ends (**18**) of said vanes are located outside the radial slots.



a lift ring (**20**) having an inner circumferential portion provided with a mechanism wall (**19**) and mounted eccentrically in said housing around said rotor (**12**) so as to have an eccentricity (**23**) relative to said rotor, said mechanism wall (**19**) of the lift ring (**20**) cooperating with said second ends (**18**) of the vanes to move each of the vanes in the radial slots through a compression stage, a vacuum stage, a first reversing stage and a second reversing stage during a revolution of the rotor (**12**) to simultaneously force a volume change in each of the compression chambers (**17**), and

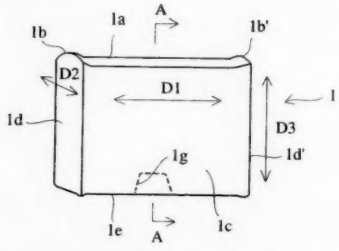
means for facilitating radial motion of the vanes in the radial slots (**14**) as soon as each of said vanes (**15**) passes through said first reversing stage and said second reversing stage, said means for facilitating the radial motion of the vanes including at least one beveled edge (BE) provided on the second end (**18**) of each of the vanes to facilitate the radial motion of the vanes during the first reversing stage, and means for controlling and adjusting a compression chamber pressure of a pressurized medium provided in said compression chamber (**17**) and acting on said first end (**16**) of each of said vanes (**15**) to an intermediate pressure depending on a system pressure when said vane passes through said second reversing stage, so as to maintain a constant pressure ratio of said intermediate pressure to said system pressure, said means for controlling and adjusting comprising a gate valve (**35**) integrated in said housing (H).

6,015,279

VANE AND METHOD FOR PRODUCING SAME

Fujio Yamane, Tottori-ken, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Oct. 23, 1997, Appl. No. 956,791
Claims priority, application Japan, Nov. 15, 1996, 8-304688
Int. Cl.[7] F04C *29/00*
U.S. Cl. 418—259 **2 Claims**



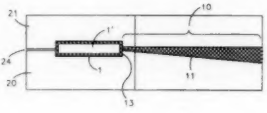
1. A vane substantially in a flat rectangular parallelepiped shape having (a) two wide side surfaces opposing in a thickness direction and being slidable in each guide groove of a rotor of an actuator, (b) two narrow side surfaces opposing in a width direction, (c) an as-cold-worked top surface having an arcuately projecting cross section in a plane perpendicular to the width direction and being in slidable contact with a cam surface of the actuator for sealing, and (d) a bottom end surface opposing the top surface, both ends of said top surface in the width direction being bulging toward said cam surface.

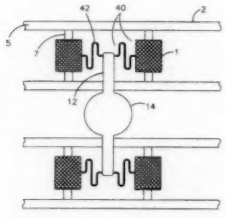
6,015,280

APPARATUS FOR REDUCING WARPING OF PLASTIC PACKAGES

Richard C. Blish, II, Saratoga, and Sidharth, Santa Clara, both of Calif., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Apr. 28, 1997, Appl. No. 840,343
Int. Cl.[7] B29C *45/02;45/14*
U.S. Cl. 425—116 **10 Claims**





1. Apparatus for forming molded plastic electronic packages, said apparatus comprising:

a source for viscous encapsulant;

means, in operative combination with said source for viscous encapsulant, for inducing pressure on said encapsulant;

a mold for forming said packages;

compliant gate means, in operative combination with said source for viscous encapsulant, said means for inducing pressure on said encapsulant, and said mold, said compliant gate means for providing a path from said source for viscous encapsulant to said mold and for reducing warpage in said plastic electronic packages;

a second mold for forming said packages;

a second compliant gate means in operative combination with said source for viscous encapsulant, said means for inducing pressure on said encapsulant and said second mold, said second compliant gate means for providing a path from said source for viscous encapsulant to said second mold and for reducing warpage in said plastic electronic packages wherein said second compliant gate means is a shallowly tapered gate, which has an included angle in the range of about 4° to about 7°;

a third mold for forming said packages;

a third compliant gate means in operative combination with said source for viscous encapsulant, said means for inducing pressure on said encapsulant and said third mold, said third compliant gate means for providing a path from said source for viscous encapsulant to said third mold and for reducing warpage in said plastic electronic packages wherein said third compliant gate means is a shallowly tapered gate, which has an included angle in the range of about 4° to about 7°;

a fourth mold for forming said packages; and

a fourth compliant gate means in operative combination with said source for viscous encapsulant, said means for inducing pressure on said encapsulant and said fourth mold, said fourth compliant gate means for providing a path from said source for viscous encapsulant to said fourth mold and for reducing warpage in said plastic electronic packages wherein said

fourth compliant gate means is a shallowly tapered gate, which has an included angle in the range of about 4° to about 7°; and wherein said compliant gate means is a shallowly tapered gate wherein said shallowly tapered gate has an included angle in the range of about 4° to about 7°, and wherein all included angles of every compliant gate means in operative combination with said source for viscous encapsulant including the included angle of the compliant gate means, the included angle of the second compliant gate means, the included angle of the third compliant gate means, and the included angle of the fourth compliant gate means, are all equal to each other.

6,015,281

INJECTION MOLDING MACHINE HAVING A HEATED NOZZLE TOUCH PLATE

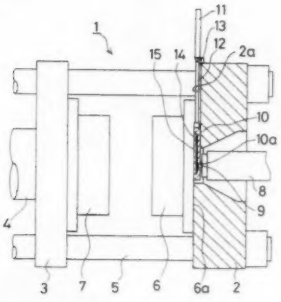
Motonori Chikazawa; Kohichi Kakinaka, both of Ohbu, and Shozo Honda, Toyama-ken, all of Japan, assignors to Kabushiki Kaisha Meiki Seisakusho, Ohbu, and Sanko Gosei Ltd., Nishi Tonami, both of Japan

Filed Jun. 22, 1998, Appl. No. 102,117

Claims priority, application Japan, Jun. 23, 1997, 9-165714; Apr. 27, 1998, 10-116656

Int. Cl.[7] **B29C** *45/23*

U.S. Cl. 425—226 **2 Claims**



1. An injection molding machine comprising:

a heating cylinder for injecting a melted and plasticized resin material from a tip opening of a nozzle into a cavity formed within a die;

shift means for enabling said heating cylinder to displace forward and backward with respect to the die and press the nozzle against the die;

a nozzle touch plate for enabling the tip opening of the nozzle of said heating cylinder to close and open; and

temperature adjusting means for adjusting the temperature of said nozzle touch plate;

wherein said nozzle touch plate is provided to enable the pressing force by said shift means to be supported when the tip opening of the nozzle of said heating cylinder is closed.

6,015,282

APPARATUS FOR THE PRODUCTION OF CORRUGATED PLASTIC TUBES

Horst Rahn, Hassfurt, Germany, assignor to Unicor GmbH Rahn-Plastmaschinen, Germany

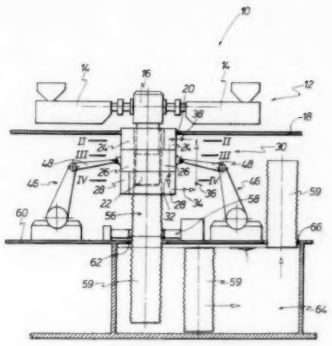
Filed May 19, 1998, Appl. No. 81,198

Claims priority, application Germany, Jun. 12, 1997, 197 24 857

Int. Cl.[7] **B29C** *51/02;51/20*

U.S. Cl. 425—233 **4 Claims**

1. Apparatus for the production of corrugated plastic tubes comprising



an extrusion device for extruding plastic material for the tubes,

at least one perpendicularly arranged injection head connected to the extrusion device for receiving the extruded plastic material for subsequent injection thereof,

a perpendicularly arranged mold section operatively associated with the injection head for receiving the plastic material therefrom, the mold section comprising at least first and second pairs of mold jaws disposed in axially mutually superposed relationship,

drive means operatively associated with each pair of mold jaws for displacement of the mold jaws of the respective pair in a radial direction and in an axial direction, and

wherein the separating planes of the mold jaws of the pairs which are arranged in axially mutually superposed relationship are displaced in a peripheral direction relative to each other through a given angle.

6,015,283

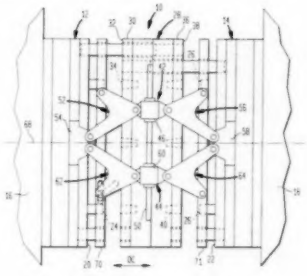
MOLD PLATE CENTRALIZING SYSTEM

Daniel Mattia, Union, N.J., assignor to National Tool & Manufacturing Co., Kenilworth, N.J.

Provisional application No. 60/048,506, Jun. 4, 1997. This application Jun. 4, 1998, Appl. No. 90,654.

Int. Cl.[7] **B29C** *45/64*

U.S. Cl. 425—556 **34 Claims**



1. In a mold assembly having:

(a) a stack of mold plates including a first plate and a second plate movable towards one another and away from one another in opening and closing directions between open and closed positions, and a third plate disposed between said first and second plates; and

(b) a plate movement control device comprising at least one linkage including:

(1) a traveling element mounted to said third plate for movement along a predetermined path of motion relative to the third plate;

(2) a first arm having a first end pivotally connected to the first plate and a second end pivotally connected to the traveling element; and

(3) a second arm having a first end pivotally connected to the second plate and a second end pivotally connected to the traveling element, said at least one linkage being arranged so that upon movement of said first and second plates between said closed position and said open position, said third plate moves away from said first plate by a first predetermined distance and moves away from said second plate by a second predetermined distance, said at least one linkage constraining said third plate against rotation around all axes perpendicular to said opening and closing directions.

6,015,284

INJECTION UNIT FOR INJECTION MOLDING MACHINES

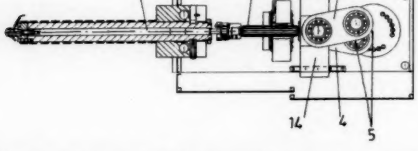
Stefan Eppich, Arbing, and Werner Kappelmuller, Schwertberg, both of Austria, assignors to Engel Maschinenbau Gesellschaft M.B.H., Schwertberg, Austria

Filed Apr. 3, 1998, Appl. No. 54,992

Claims priority, application Austria, Apr. 9, 1997, 211/97 U

Int. Cl.[7] B29C *45/50*

U.S. Cl. 425—587 **3 Claims**



1. An injection unit for injection moulding machines comprising a plasticising cylinder and a plasticising screw which is arranged rotatably therein and axially displaceably by two oppositely movable cranks characterised in that each crank (**5**, **10**) is driven by its own drive motor (**1**, **8**) which is in the form of an electric motor.

6,015,285

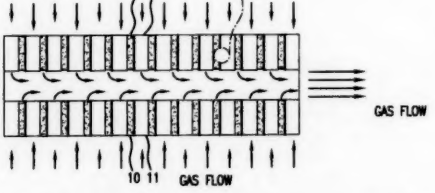
CATALYTIC COMBUSTION PROCESS

Jon G. McCarty, Portola Valley; Victor L. Wong, Daly City, and Bernard J. Wood, Santa Clara, all of Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 30, 1998, Appl. No. 16,835

Int. Cl.[7] B01J *8/02;23/44*

U.S. Cl. 431—7 **13 Claims**



1. A process for combustion of a fuel comprising the steps of:

mixing an oxygen-containing gas with a fuel to form a combustible mixture;

contacting the combustible mixture in a first zone with a first zone combustion catalyst comprising PdO disposed on a support selected from the group consisting of La_2O_3-stabilized γ-Al_2O_3, La-stabilized γ-Al_2O_3, Ce-stabilized γ-Al_2O_3, Ba-stabilized γ-Al_2O_3, and La_2O_3 hexa-aluminate at reaction conditions sufficient to combust a portion of said fuel and produce a first zone combustion catalyst temperature no greater than about 800° C., said first zone combustion catalyst being coated by a diffusion barrier layer selected from the group consisting of α-Al_2O_3 and La_2O_3-$11Al_2O_3$ hexa-aluminate; and

contacting the partially combusted fuel from the first zone in a second zone with a second zone combustion catalyst selected from the group consisting of $La_{0.5}Sr_{0.5}MnAl_{11}O_{19}$, PdO on $La_2O_3.11Al_2O_3$ hexa-aluminate, and $La_{0.2}Sr_{0.8}MnAl_{11}O_{19}$.

6,015,286

INTERNAL-COMBUSTION TYPE OF GAS LIGHTER

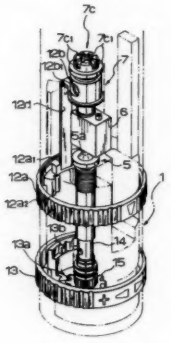
Susumu Maruyama, Tokyo, Japan, assignor to Windmill Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1997, Appl. No. 886,116

Claims priority, application Japan, Sep. 11, 1996, 8-240332

Int. Cl.[7] F23Q *2/167*

U.S. Cl. 431—130 **4 Claims**



1. An internal-combustion type of gas lighter comprising:

a cylindrical lighter housing enclosing a lighter body having a fuel gas reservoir therein;

a fuel gas ejection nozzle in communication with the fuel gas reservoir via a valve;

a lid permitting ignition of a combustible mixture when open and preventing ignition when shut;

an orifice member positioned downstream of the fuel gas ejection nozzle to increase the flow rate of fuel gas ejected from the fuel gas ejection nozzle;

a mixing tube positioned downstream of the orifice member, said mixing tube having air injection apertures to suck air under a negative pressure caused by a jet flow of fuel gas from the orifice member, thereby providing a fuel gas-and-air combustible mixture;

a diffuser positioned downstream of the mixing tube to decrease the flow rate of the combustible gas mixture and to diffuse the combustible mixture;

an ignition actuator to operate a piezoelectric element for igniting the combustible mixture;

a combustion cylinder positioned downstream of the diffuser to permit the complete combustion of the combustible mixture therein;

a flame controller which controls the flow rate of the fuel gas supplied to the combustion cylinder; and

an air injection controller, adjustable independently of the flame controller, for controlling the amount of air to be fed to the mixing tube, the air-injection controller having a thumb ring rotatably fixed to the cylindrical housing and operatively connected to an adjustable, apertured piece rotatably fitted

surrounding the mixing tube, and adjustable to place an aperture thereof in alignment with an air-injection aperture of the mixing tube.

6,015,287

LIQUID HYDROCARBON BURNER

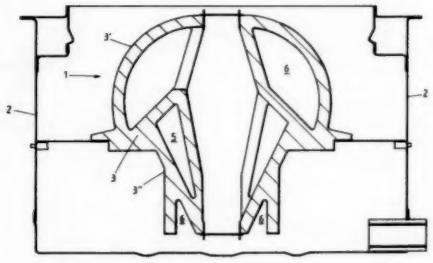
Claude Berlaimont, Falisolle, and Raymond Champion, Couvin, both of Belgium, assignors to Thermic Investment, Luxembourg, Luxembourg

Filed Jan. 15, 1997, Appl. No. 784,133

Claims priority, application Belgium, Jan. 18, 1996, 09600044

Int. Cl.[7] **F23D** *5/02*

U.S. Cl. 431—338 **11 Claims**



1. A liquid hydrocarbon burner, comprising:

a single-walled pot; and

a catalytic element placed centrally in the single-walled pot and comprised of an assembly of blades which are arranged concentrically around a vertical axis, which have in axial cross-section a mushroom shape, and which blades have respective upper parts and lower parts with respective weights such that the weight of the lower parts is greater than that of the upper parts.

6,015,288

OVEN FOR GLASS ARTICLE

Christopher Cyril Mundon, Wall Heath, United Kingdom, assignor to Stein Atkinson Stordy Limited, United Kingdom

PCT No. PCT/GB96/01168, § 371 Date Feb. 20, 1998, § 102(e) Date Feb. 20, 1998, PCT Pub. No. WO96/36571, PCT Pub. Date Nov. 21, 1996

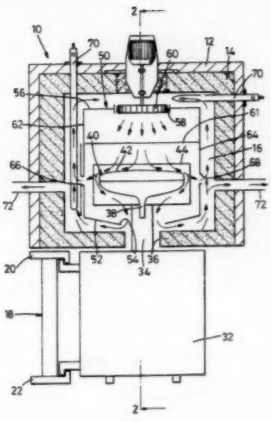
PCT Filed May 15, 1996, Appl. No. 952,631

Claims priority, application United Kingdom, May 18, 1995, 9510049

Int. Cl.[7] **F27B** *5/16*

U.S. Cl. 432—212 **18 Claims**

1. An exhaust oven for heat treating and simultaneously evacuating cathode ray tubes (**40**), said oven comprising a tunnel structure (**10**) defining a through passage, temperature control means for providing regulated heating and cooling of the atmosphere contained in one or more longitudinal zones of the passage, transport means (**32**) for conveying the tubes along said passage and including exhaust ducts operatively connected to the necks (**38**) of the tubes during conveyance to evacuate gases therefrom, and baffle means (**50**) within at least one said zone of the passage for circulating said atmosphere about the exterior of the tubes: characterized in that the baffle means includes at least one inlet formation (**58**) directing a flow of atmosphere to impinge onto the large area face of the screen panel (**42**) of each tube in use, and one or more outlet formations (**66**, **68**, **54**) in adjacent spaced acting relationship to side edges of said panel and to the neck of the tube for exit of said flow from the baffle means, at least one of the outlet



formations (**66**, **68**) adjustable in effective cross sectional area for selective adjustment of the circulation about the tubes (**40**) in use.

6,015,289

CUSTOM ORTHODONTIC APPLIANCE FORMING METHOD AND APPARATUS

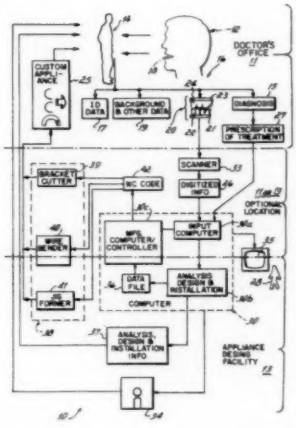
Craig A. Andreiko, Alta Loma, and Mark A. Payne, Whittier, both of Calif., assignors to Ormco Corporation, Orange, Calif.

Continuation of application No. 08/456,666, Jun. 2, 1995, Pat. No. 5,683,243, which is a division of application No. 07/973,973, Nov. 9, 1992, Pat. No. 5,431,562, which is a division of application No. 07/973,965, Nov. 9, 1992, Pat. No. 5,454,717, which is a division of application No. 07/973,947, Nov. 9, 1992, Pat. No. 5,447,432, which is a division of application No. 07/973,844, Nov. 9, 1992, Pat. No. 5,368,478. This application Oct. 30, 1997, Appl. No. 960,908.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61C** *3/00*

U.S. Cl. 433—3 **15 Claims**



1. A method of fabricating a custom orthodontic appliance to position teeth of a patient to preferred finish positions in the mouth of the patient, the method comprising the steps of:

measuring anatomical shapes from the mouth of the patient, and producing thereby digitized anatomical shape data;

deriving an archform from the digitized data with a specially programmed digital computer;

deriving with the computer tooth finish positions from the digitized data and the derived archform;

establishing an appliance connection point on each of a plurality of the teeth;

designing an appliance configuration with the computer from the digitized data, the established appliance connection points and the derived tooth finish positions, and producing machine code in accordance with the designed appliance configuration; and

automatically fabricating a custom orthodontic appliance with a machine in response to the machine code to conform to the designed appliance configuration.

6,015,290

DENTAL HANDPIECE

Otto Rosenstatter, Matzing 105, A-5164 Seeham, Austria

Filed Dec. 22, 1998, Appl. No. 217,969

Int. Cl.[7] A61C *3/00; 1/10*

U.S. Cl. 433—29 **5 Claims**

1. A dental handpiece comprising:

a headpiece in which a treatment tool for preparation of a place being treated can be fitted;

a handgrip having a rear region and a forward region, the forward region having a longitudinal axis, wherein the headpiece is attachable to the forward region of the handgrip; and

a lighting member arranged in the forward region of the handgrip, the lighting member including an incandescent lamp having a longitudinal axis, wherein the longitudinal axis of the incandescent lamp is substantially parallel to the longitudinal axis of the forward region of the handgrip, wherein a light outlet is provided in the handgrip laterally adjacent to the incandescent lamp, and wherein a lens for focusing the light emitted from the incandescent lamp onto the place being treated is provided laterally on the incandescent lamp or in the light outlet of the handgrip laterally adjacent to the incandescent lamp.

6,015,291

DENTAL ARTICULATOR

Rudolf Cramer, Sachsenkam, Germany, and Rudolf Slavicek, Wien, Austria, assignors to Synthese Dentale Forschungs- und Entwicklungsgesellschaft mbH, and Gamma Wisenschaftliche Fortbildungsgesellschaft mbh, both of Klosterneuburg, Austria

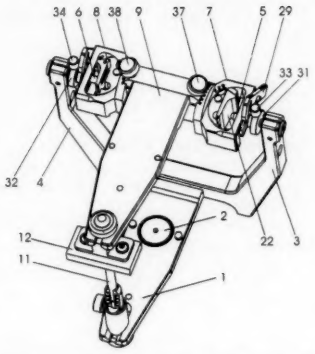
Filed Jun. 25, 1998, Appl. No. 104,624

Claims priority, application Germany, Jun. 26, 1997, 197 26 978; Aug. 29, 1997, 197 37 661

Int. Cl.[7] A61C *11/02*

U.S. Cl. 433—57 **23 Claims**

1. Dental articulator having upper and lower members (**9**, **1**), with condylar housings located on the upper member for accommodating and guiding condyles fixed to the lower member, where guide elements for the condyles for simulating the sagittal movements of the mandibular joint and Bennett guide elements for simulating the transverse movements of the mandibular joint are located in the condylar housing, characterised in that, for spatially controlled guidance on a laterotrusion side, each condyle comprises a condylar pin (**5**, **6**) which extends along a joint axis



through a condylar guide in the condylar housing (**7**, **8**) connected to the upper member (**9**) of the articulator in detachable fashion through a guide slit (**25**) in a condylar insert (**24**) into the condylar housing (**7**, **8**), in that a free end of the condylar pin (**5**, **6**) can be positioned against a guide surface (**22**) of a Bennett guide element, which comprises a variable-angle Bennett insert (**18**), in the condylar housing (**7**, **8**), in that directions of action of a sagittal guideway (**28**) of the condylar insert (**24**) for condylar guidance and of the guide surface (**22**) of the Bennett insert (**18**) are perpendicular to each other, and in that the condylar housing (**7**, **8**) is open on one side in the direction of the upper side of the dental articulator.

6,015,292

DENTAL REAMERS AND PROCESS FOR MANUFACTURING SAME

Hubert Euvrard, Geneuille, and Denis Chevillot, Miserey Salines, both of France, assignors to Micro-Mega International Manufactures, Besancon, France

Filed Jan. 22, 1998, Appl. No. 12,464

Claims priority, application France, Jan. 29, 1997, 97 01131

Int. Cl.[7] A61C *5/02*

U.S. Cl. 433—102 **8 Claims**

1. A process for manufacturing a dental reamer from a cylindrical blank of a nickel-titanium alloy by moving the cylindrical blank at a feed speed V_A past a rotary grinding wheel whose disk, of variable diameter, has a linear speed V_L relating to the rate at which material is removed, wherein the linear speed V_L is greater than about 91440 cm/min and the feed speed V_A is less than about 7.62 cm/min.

6,015,293

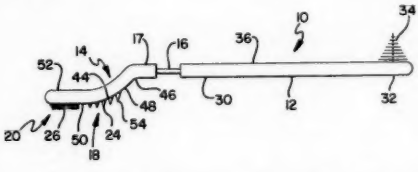
ORAL CLEANING APPARATUS

Ronald J. Rimkus, Flossmoor, Ill., assignor to AMTEC Products, Inc., Flossmoor, Ill.

Filed Dec. 31, 1997, Appl. No. 1,761

Int. Cl.[7] A61C *3/00*

U.S. Cl. 433—141 **21 Claims**



1. An oral cleaning apparatus for cleaning the surface of the tongue, the apparatus comprising:

an elongated handle;

a head component having a cleaning surface with a convex portion thereto, a first section and a second section on the cleaning surface, the first section being comprised of a cleaning portion and the second section being comprised of an absorbent portion; and,

a flexible member connecting the elongated handle and the head component.

6,015,294

DENTAL IMPLANT

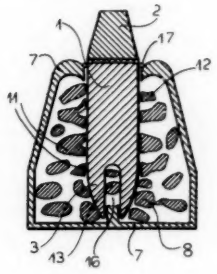
Nikola Lauks, Saalkamp 8, D-22397 Hamburg, Germany

Filed Sep. 17, 1998, Appl. No. 156,531

Claims priority, application Germany, Sep. 19, 1997, 29716883 U

Int. Cl.[7] **A61C** *8/00*

U.S. Cl. 433—173 **12 Claims**



1. A jaw implant for superstructure adapted to receive a dental prosthesis, comprising:

an elongated implant body formed at one end with a superstructure adapted to receive a dental prosthesis and an opposite end; and

at least three elongated wedges arrayed along a circle centered on a longitudinal axis of the body, extending from said other end, and adapted to be anchored in spongiosa of the jaw upon seating of said implant in a bore in a bone of the jaw of a patient.

6,015,295

NATAL ZODIAC CHART

John Raymond Winks, Jr., 42 Rollingwood Dr., San Rafael, Calif. 94901

Filed Jun. 23, 1998, Appl. No. 103,088

Int. Cl.[7] **B42D** *15/00*; **G09B** *29/00*

U.S. Cl. 434—106 **19 Claims**

1. A natal zodiac chart for use in the astrological arts, comprising:

(a) an inner circular chart adapted to provide a first information;

(b) an outer circular chart adapted to provide a second information, said outer circular chart disposed concentrically around said inner circular chart and proximate thereto;

(c) a plurality of symbols for placement where desired on said outer circular chart;

(d) means for detachably attaching each of said plurality of symbols to said outer circular chart; and

(e) a base adapted to support at least one of said inner circular chart and said outer circular chart, said base formed of a flexible magnetic sheet.

18. A method for providing astrological information, comprising:

(a) providing a circular natal chart showing astrological information at the time of birth for a person;

(b) providing a circular chart of the zodiac showing current astrological information;

(c) aligning said chart of the zodiac concentrically with respect to said natal chart; and

(d) providing at least one symbol of an astrologically significant celestial object that is detachably attachable to said chart of the zodiac.

6,015,296

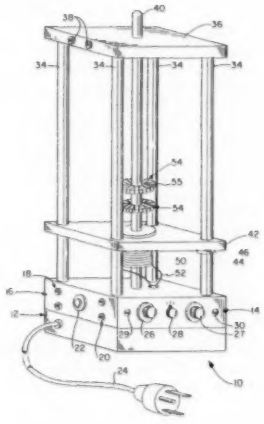
APPARATUS FOR GENERATING NONLINEAR DYNAMIC CHAOTIC MOTION

John M. Fenkanyn, Akron, and Tom T. Hartley, Mogadore, both of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Feb. 3, 1997, Appl. No. 794,686

Int. Cl.[7] **G09B** *23/06*

U.S. Cl. 434—301 **15 Claims**



1. An apparatus for generating nonlinear motion, comprising:

a rod;

an electromagnet positioned in proximity to said rod;

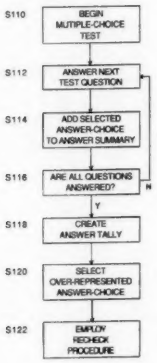
at least one magnet slidable upon said rod; and

means for controlling the operation of said electromagnet, wherein said controlling means receives periodic input that causes said electromagnet to deflect said at least one magnet in nonlinear motion upon said rod.

6,015,297
METHOD OF TEACHING AN EXAMINEE TO TAKE A MULTIPLE-CHOICE EXAMINATION

Michael Liberman, 2502 Tatnuck Ct., Herndon, Va. 20171

Filed Mar. 26, 1998, Appl. No. 48,303
Int. Cl.[7] G09B *3/00*
U.S. Cl. 434—322 17 Claims



1. A method of teaching a person to take a multiple-choice test in an efficient manner, where such multiple-choice test has the same fixed number of uniformly labeled possible answer-choices for each multiple-choice test question, said method comprising:

(a) teaching said person to keep an answer summary of all of the test questions for which said person has determined an answer by selecting an answer-choice,

said answer summary comprising, for each question for which said person has selected an answer-choice, the selected answer-choice for that particular question;

(b) teaching said person to keep an answer tally,

said answer tally comprising an occurrence number for each of the possible answer-choices,

said occurrence number for each particular answer-choice being set equal to the number of times that that particular answer-choice occurs as a selected answer-choice in the answer summary;

(c) teaching said person to select as an over-represented answer-choice, an answer-choice that has an occurrence number equal to the occurrence number with the largest value in said answer tally; and

(d) teaching said person to employ a recheck procedure,

said recheck procedure comprising the step of reviewing at least one of those particular questions for which the selected answer-choice in said answer record happens to be the over-represented answer-choice.

6,015,298
VACUUM-CLEANER HOSE WITH ELECTRICAL CONDUCTORS

Georg Peter Linhart, Wöllstadt, Germany, assignor to Truplast Konststofftechnik GmbH, Langgöns, Germany

Filed Jun. 9, 1998, Appl. No. 93,893
Int. Cl.[7] H01R *39/00*
U.S. Cl. 439—24 8 Claims

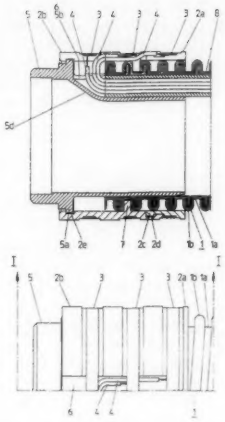
1. A vacuum-cleaner hose with electrical conductors, comprising

a hose made of a soft thermoplastic material and exhibiting spiral, screw-like wave crests and wave troughs at an outer face;

a support carrier attached at one end of the hose, wherein the support carrier is made out of a harder material than the material of the hose, and wherein the support carrier is formed of

a socket ring and a sleeve disposed in front of the socket ring;

a continuous axial slot provided at the sleeve;



at least one slip ring placed onto the socket ring, and two additional slip rings placed onto the sleeve;

an end socket inserted into the one end of the hose exhibiting the support carrier, wherein the end socket is connected to the support carrier and is made of the same material as the support carrier, and wherein the sleeve is connected on the one hand form-matchingly to the socket ring and on the other hand form-matchingly to the end socket;

at least one thread turn formed at an inner jacket face of the sleeve, wherein the thread turn forms a counter thread for the wave troughs and the wave crests of the hose;

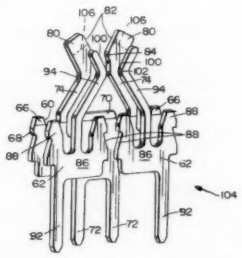
electrical conductors, wherein one of the electrical conductors is in each case connected to one slip ring;

a protective casing disposed in the hose, wherein ends of the electrical conductors are guided out of the protective casing, first into the axial slot of the sleeve and then to the slip rings, coordinated to the ends of the electrical conductors and openly disposed inside the axial slot.

6,015,299
CARD EDGE CONNECTOR WITH SYMMETRICAL BOARD CONTACTS

Alan S. Walse, LaGrange; Harold Keith Lang, Fox River Grove; Augusto P. Panella, Naperville; Irvin R. Triner, Willowsprings, all of Ill., and Shyh-Lin Tung, Taiping, Taiwan, assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 22, 1998, Appl. No. 120,485
Int. Cl.[7] H01R *9/09*
U.S. Cl. 439—60 23 Claims



1. An electrical circuit assembly comprising a printed circuit board having a plurality of conductive regions, an electrical connector having an elongated insulated housing with a longitudinal axis, a plurality of generally planar, electrical terminals mounted in said housing, the plane of each electrical terminal being generally perpendicular to said longitudinal axis, and each electrical terminal

having at least one board contact extending from said housing for connection to said conductive regions, said board contacts and said conductive regions defining a plurality of conductive paths extending between said circuit board and said connector, said conductive paths being of two types, a first type being signal paths for carrying high frequency signals and a second type being reference paths for carrying ground and power signals, each of said paths including one of said board contacts and one of said conductive regions, said paths being arrayed as follows:

said paths being arrayed solely along two opposed inner lines and two opposed outer lines, each said line being generally parallel to the longitudinal axis of said housing;

each said path in one of said inner lines being laterally aligned with a path in the other of said inner lines to define pairs of inner paths and each said path in one of said outer lines being laterally aligned with a path in the other of said outer lines to define pairs of outer paths; and

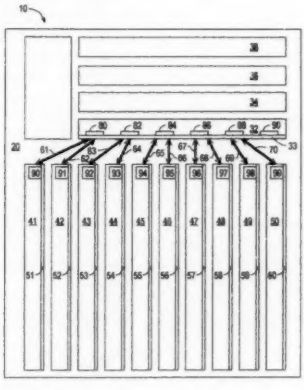
said paths of said first type all being positioned along said inner lines and said paths of said second type all being positioned along said outer lines.

6,015,300

ELECTRONIC INTERCONNECTION METHOD AND APPARATUS FOR MINIMIZING PROPAGATION DELAYS

Raymond J. Schmidt, Jr., Stoughton; Mahesh N. Ganmukhi, Carlisle, and Patrick L. DeAngelis, Northborough, all of Mass., assignors to Ascend Communications, Inc., Westford, Mass.

Filed Aug. 28, 1997, Appl. No. 919,825
Int. Cl.[7] H01R *9/09*
U.S. Cl. 439—61 **14 Claims**



1. A module interconnect for minimizing electronic signal propagation delay comprising:

a backplane having a first side and a second side;

a first plurality of connector rows, each row containing at least one connector mounted on said backplane in a generally parallel side by side relation with at least one connector of another one of said first plurality of rows, each connector within said first plurality of rows having a plurality of contacts, said connectors within said first plurality of rows mounted within a first area of said backplane;

a second plurality of connector rows, each row containing at least one connector mounted on said backplane in a generally parallel side by side relation with at least one connector of another one of said second plurality of rows, each connector within said second plurality of rows having a plurality of contacts, said connectors within said second plurality of rows mounted within a second area of said backplane, each one of said second plurality of connector rows containing a first connector having a first connector end disposed adjacent to at least one connector within one of said first plurality of connector rows, said second plurality of rows disposed non-parallel with respect to said first plurality of rows, and wherein said first area of said backplane does not overlap said second area of said backplane on either side of said backplane; and

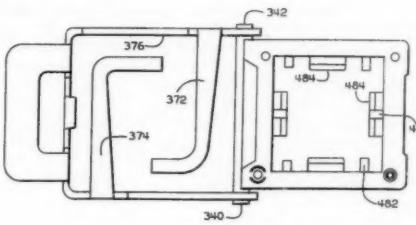
a plurality of signal lines for carrying digital information signals comprising at least first and second voltage levels, each of said plurality of signal lines interconnecting at least one contact of a connector within one of said first plurality of connector rows with a contact of a connector in each of only a subset of said second plurality of connectors.

6,015,301

SURFACE MOUNT SOCKET

William Louis Brodsky, Binghamton; Benson Chan, Vestal; Glenn Edward Myrto, Binghamton, and John Henry Sherman, Lisle, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/591,206, Jan. 17, 1996, Pat. No. 5,785,535. This application Jul. 23, 1998, Appl. No. 121,452.
Int. Cl.[7] H01R *9/09*
U.S. Cl. 439—73 **6 Claims**



1. A socket for providing relatively easy replacement of an area array component of an interconnect structure having an area array site and positioned on a substrate, said socket comprising:

a base positioned on a substrate adjacent said area array site of said interconnect structure;

a spring member hingedly positioned on said base and having a first and a second end, and a central member positioned at said first end and including first and second spring arm members projecting therefrom;

a pressure distribution member for distributing pressure onto said area array component, said first and second spring arm members of said spring member engaging said pressure distribution member to bias said area array component toward said area array site of said interconnect structure;

a torsion arresting member for preventing twisting of said first and second spring arm members projecting from said central member; and

a coupler for selectively mechanically holding down said second end of said spring member, said coupler adapted for being selectively uncoupled to allow replacing of said area array component, thereby reusing said base and said spring member.

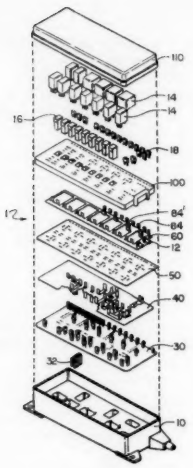
6,015,302

POWER DISTRIBUTION CENTER

Lawrence D. Butts, Shelby Township; Charles L. Robinson, Clinton Township; Douglas Simpson, Mount Clemens, and Joseph L. Dery, White Lake Township, all of Mich., assignors to Thomas & Betts International, Inc., Memphis, Tenn.

Provisional application No. 60/029,247, Oct. 24, 1996. This application Oct. 22, 1997, Appl. No. 955,643.
Int. Cl.[7] H01R *9/09*
U.S. Cl. 439—76.2 **13 Claims**

1. A power distribution center for a vehicle comprising:



a housing/connector plate including a wiring harness connector having a plurality of contacts;

at least one conductive assembly disposed within said power distribution center, said conductive assembly comprising

a printed circuit board having a plurality of conductive etches formed thereon and therein; and

a plurality of terminal blades disposed on said printed circuit board, selected ones of said plurality of terminal blades in electrical communication with selected ones of said plurality of contacts through selected ones of said conductive etches;

a leadframe assembly including a non-conductive substrate having at least one leadframe stamping attached thereto, said at least one leadframe stamping isolated from said printed circuit board; and

a power bus bar having a power connection and a plurality of terminal blades extending therefrom, disposed within said power distribution center.

6,015,303

ELECTRICAL RECEPTACLE ASSEMBLY WITH MULTIPLE SITES OF DUAL SNAP-FIT SECUREMENT MEANS

Nelson Bonilla, West Haven, and Thomas J. Vigorito, Fairfield, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Oct. 17, 1997, Appl. No. 953,452

Int. Cl.[7] H01R *4/66*

U.S. Cl. 439—107 **16 Claims**

1. An electrical receptacle assembly, comprising:

(a) a housing including

(i) a front cover, and

(ii) a back cover being adapted to interfit with said front cover in a mating relationship so as to define an interior cavity for enclosing electrical components; and

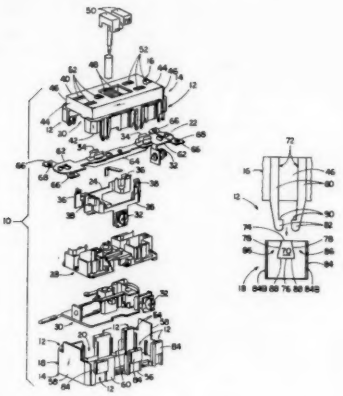
(b) a plurality of dual snap-fit securement means provided on said housing, each of said dual snap-fit securement means of said plurality thereof including

(i) a lug attached on one of said front and back covers of said housing, said lug having first an second ends and a pair of opposite side surfaces spaced apart and facing away from one another and extending from said first end of said second end of said lug, and

(ii) a pair of latching tabs attached on the other of said front and back covers of said housing and disposed in a latching position relative to one another in which said latching tabs are adapted to make interlocking engagement with said lug upon interfitting of said front and back covers into said mating relationship with one another, said latching tabs including

respective body portions fixedly attached to said other of said front and back covers and extending outwardly therefrom toward said lug on said one of said front and back covers; and

respective outer end portions on said respective body portions adapted to interlock with said lug when said one of said front and back covers is interfitted with said other of said front and back covers, said respective outer end portions of said latching tabs being aligned with respective ones of said opposite side surfaces of said lug so that said respective outer end portions of said latching tabs will initially engage said opposite side surfaces of said lug at said first end thereof as said front and back covers are being interfitted with one another, and said latching tabs making latching engagement with said lug when said front and back covers are mated together.



6,015,304

GROUND-ENHANCED ELECTRICAL CONNECTOR

Masanori Yagi, Ebina; Atsuhito Noda, Hachioji; Yasuhiro Ichijo, and Hideyuki Hirata, both of Yokohama, all of Japan, assignors to Molex Incorporated, Lisle, Ill.

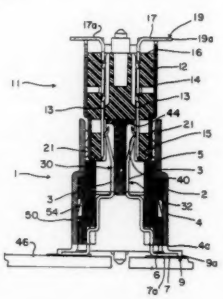
PCT No. PCT/US96/20250, § 371 Date Jul. 27, 1998, § 102(e) Date Jul. 27, 1998, PCT Pub. No. WO97/24782, PCT Pub. Date Jul. 10, 1997

PCT Filed Dec. 23, 1996, Appl. No. 91,980

Claims priority, application Japan, Dec. 29, 1995, 7-353375

Int. Cl.[7] H01R *13/648*

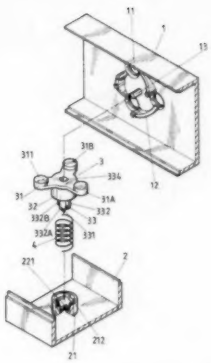
U.S. Cl. 439—108 **24 Claims**



1. In an electrical connector having an elongated housing with at least one housing wall formed from an electrically insulative

material and a plurality of electrically conductive terminals mounted on the connector housing, the conductive terminals having solder tail portions extending out of and away from said connector housing along an extent of said housing wall, said solder tail portions being spaced apart from each other in a first predetermined spacing, said connector further having an electrically conductive grounding plate mounted on outside of said connector housing and extending along said housing wall extent, the improvement, comprising:

at least one primary grounding terminal integrally formed in said grounding plate at the level of said conductive terminal solder tail portions, and said conductive terminal solder tail portions being arranged in at least two discrete groups spaced apart from each other in a second predetermined spacing to define a grounding space that separates said two discrete groups of conductive terminal solder tail portions, the grounding space receiving said primary grounding terminal therein.

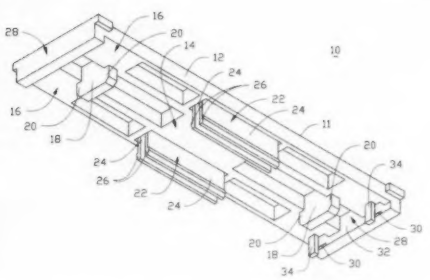


6,015,305

HOLDING DEVICE FOR MOUNTING CONNECTOR ON BOARD

Robert G. McHugh, Evergreen, Colo.; Yu-Ming Ho, Pen-Chiao, and Ming-Chuan Wu, Taipei Hsien, both of Taiwan, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

Filed Jul. 10, 1997, Appl. No. 889,968
Int. Cl.[7] H01R *13/44*
U.S. Cl. 439—135 **4 Claims**



1. An arrangement of holding a connector for mounting to a PC board, comprising:

a holding device with restraint means connected to both end faces, a lengthwise dimension of the holding device being somewhat larger than that of the connector so that the holding device may confine the connector therein; and

at least a retention member extending downward from the holding device between said restraint means and adapted to be received within a cavity of the connector.

6,015,306

SHUTTER STRUCTURE OF APERTURE

Tsang Lan Jen, No. 1, Lane 199, Sec. 1, Min Chuan Rd., Tainan, Taiwan

Filed Sep. 30, 1997, Appl. No. 944,097
Int. Cl.[7] H01R *13/44*
U.S. Cl. 439—139 **4 Claims**

1. A shutter structure of an aperture comprising:

a base shell having an interior surface;

a thimble fixedly mounted on said interior surface of said base shell, said thimble having an inner rim with a plurality of chamfers formed on said inner rim, said thimble having a first set of axially beveled guide teeth formed within an interior volume of said thimble;

a pair of conducting strips fixedly secured to said base shell;

a spring having a first end inserted within said interior volume of said thimble;

a shutter member having opposing upper and lower surfaces, said shutter member having a hollow cylinder extending from a central portion of said lower surface having an interior cylindrical volume and said hollow cylinder being in contact with a second end of said spring, said shutter member having at least one projection formed on said upper surface;

a shaft barrel extending from said central portion of said lower surface and mounted within said interior cylindrical volume of said hollow cylinder, said shaft barrel having a circumferential surface and a lower shaft surface, said circumferential surface having a plurality of strip ribs formed thereon, said plurality of strip ribs formed to mate with said plurality of chamfers formed on said inner rim of said thimble whereby when an unbalanced force is applied to said shutter member at least one of said strip ribs engages with a respective one of said chamfers and rotatingly locks said shutter member;

a second set of beveled guide teeth formed on said lower surface of said shaft barrel;

an upper shell overlaying said base shell and affixed thereto, said upper shell having a plurality of sockets for receiving conducting pins of an electrical plug therein, each of said sockets being located in aligned relationship with a respective one of said projections of said shutter member for initiating a rotation of said shutter member when insertion of said conducting pins into said sockets causes contact between said first set of beveled guide teeth and said second set of beveled guide teeth, whereby contact and subsequent lateral movement of said second set of beveled guide teeth with respect to said first set of beveled guide teeth causes a rotation of said shutter member to provide a path for said conducting pins to electrically contact said pair of conducting strips.

6,015,307

ELECTRIC OUTLET WITH ROTARY SOCKET BODIES

Pen-Fu Chiu, 6F., Alley 7, Lane 270, No. 9-1, Chung Pin Rd., and Chin-Shen Su, 5F., Alley 5, Lane 28, No. 1, Ho Kang I Rd., both of Hsinchuan City, Taipei Hsien, Taiwan

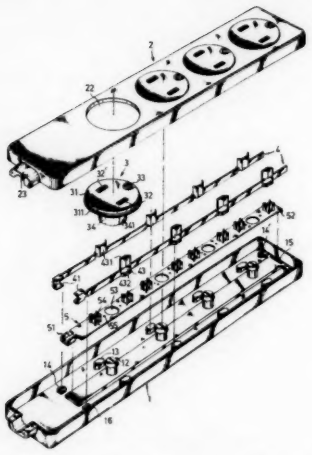
Filed Oct. 21, 1998, Appl. No. 176,437
Int. Cl.[7] H01R *13/44*
U.S. Cl. 439—139 **8 Claims**

1. An electric outlet comprising:

a rectangular top-open casing having a row of male coupling elements on the middle and two longitudinal rows of locating blocks at two opposite sides of said longitudinal row of male coupling elements;

a cover shell covered on said casing, said cover shell having a plurality of socket holes longitudinally arranged in a line;

a plurality of rotary socket bodies respectively mounted in said casing, said rotary socket bodies each having a bottom female coupling means respectively coupled to the male coupling



elements of said casing, a flat circular head respectively inserted into the socket holes on said cover shell, and two metal blade insertion slots and one grounding prong insertion slot provided at said flat circular head and adapted to receive the metal blades and grounding prong of an electric plug;

a grounding strip longitudinally mounted in said casing on the middle for connection to the grounding wire of the electric wire to be used with the electric outlet, said grounding strip comprising a plurality of longitudinally spaced through holes, which receive the male coupling elements of said casing, and electric contact means respectively disposed at two opposite sides of each through hole and longitudinally aligned for receiving the grounding prong of an electric plug; and

two metal conductive strips mounted in said casing and longitudinally arranged in parallel at two opposite sides of said grounding strip for connection to the hot wire and neutral wire of the electric wire to be used with the electric outlet, said metal conductive strips each having a plurality of longitudinally spaced coupling units respectively coupled to the locating blocks of said casing;

wherein when the metal blades and grounding prong of an electric plug are inserted into the metal blade insertion slots and grounding prong insertion slot of one of said rotary socket bodies, the rotary socket body can be rotated on the respective male coupling element inside said casing and retained between "ON" position to hold the metal blades and grounding prong of the installed electric plug in contact with the coupling units of said metal conductive strips and the electric contact means to said grounding strip, and "OFF" position to disconnect the metal blades and grounding prong of the installed electric plug from the coupling units of said metal conductive strips and the electric contact means of said grounding strip.

6,015,308

DOCKING STATION FOR A NOTEBOOK COMPUTER

Chia-Chun Lee; Ming-Hsun Chou; Jui-Jung Huang, and Chih-Wen Chiang, all of Taipei, Taiwan, assignors to Compal Electronics, Inc., Taiwan

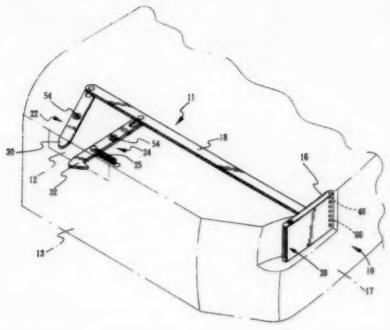
Filed Feb. 1, 1999, Appl. No. 240,595

Int. Cl.[7] H01R *13/62*

U.S. Cl. 439—155 **18 Claims**

1. A docking station for a notebook computer that has a rear wall provided with a first connector set, the rear wall defining a longitudinal axis, said docking station comprising:

a housing having a front wall adapted to be disposed adjacent to and parallel to the rear wall of the notebook computer, said front wall being provided with a second connector set that is



adapted to connect electrically and mechanically with the first connector set, said front wall being formed with an ejector opening, said housing being further formed with an access opening and having a lateral wall adjacent to said front wall and transverse to said front wall; and

an ejector device including

a linking arm disposed in said housing, said linking arm being movable in said housing in a longitudinal direction between operated and non-operated positions, said linking arm having a connecting end and an operating end accessible via said access opening to permit movement of said linking arm from the non-operated position to the operated position,

an ejecting member disposed in said housing adjacent to said ejector opening, said ejecting member having a first pivot portion connected pivotally to said connecting end of said linking arm, a second pivot portion connected pivotally to said housing, and an ejecting portion that is retracted in said housing when said linking arm is in the non-operated position, and that extends out of said housing via said ejector opening so as to be adapted to push the rear wall of the notebook computer away from said front wall when said linking arm is in the operated position,

an operating member disposed outside said housing adjacent to said access opening, said operating member having a third pivot portion connected pivotally to said operating end of said linking arm and a fourth pivot portion connected pivotally to said housing, and

a biasing member for biasing said linking arm to the non-operated position.

6,015,309

PC CARD CONNECTOR

Hidehiro Nakamura; Kazuki Satou, and Wataru Oguchi, all of Miyagi-ken, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 11, 1998, Appl. No. 38,614

Claims priority, application Japan, Mar. 12, 1997, 9-057993

Int. Cl.[7] H01R *13/62*

U.S. Cl. 439—159 **2 Claims**

1. A PC card connector comprising:

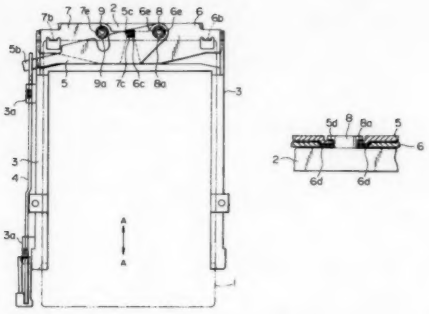
a pin housing having a plurality of pin contacts to be connected to socket contacts of a PC card;

a push-rod reciprocally supported by a frame integrally formed with said pin housing to be pressed for unloading the PC card;

a drive lever pivotally supported by a first support shaft standing on said pin housing, and engaged with said push-rod at one end thereof;

a first turn arm pivotally supported by said first support shaft, provided at one end with a first protrusion for pushing out the PC card, and coupled at the other end to a fixed position on said drive lever; and

a second turn arm pivotally supported by a second support shaft standing on said pin housing, provided at one end with a



second protrusion for pushing out the PC card, and coupled at the other end to the fixed position on said drive lever,

wherein said first support shaft is provided with a fall-preventive section projecting outward from the leading end in the radial direction,

wherein said drive lever and said first turn arm are each provided with a hole to be fitted on said first support shaft,

wherein cutouts are formed on the rims of said holes corresponding to said fall-preventive section,

wherein sections on the rims of said holes of said drive lever and said first turn arm are formed thinner than other sections, and one of said thin sections is fitted in the other thin section, and

wherein the sum of thicknesses of said drive lever and said first turn arm is approximately equal to the length of said first support shaft, and said fall-preventive section is engaged with said one of said thin sections while said drive lever and said first turn arm are fitted on said first support shaft so as to be prevented from falling off.

6,015,310

ELECTRICAL CONNECTOR FOR FLAT CIRCUITRY

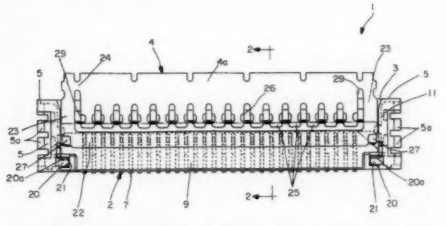
Katsutoshi Tojo, Sagamihara, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Jul. 23, 1998, Appl. No. 121,517

Claims priority, application Japan, Dec. 12, 1997, 9-362849; Dec. 12, 1997, 9-362850

Int. Cl.[7] H01R *13/15*

U.S. Cl. 439—260 **13 Claims**



1. An electrical connector for receiving a flat electrical circuit, comprising:

an elongated dielectric housing defining a slot for receiving the flat electrical circuit;

a plurality of terminals mounted on the housing with contact portions spaced along the slot, the contact portions being fixed against movement relative to the housing;

a metal actuator mounted on the housing for movement between a first position allowing free insertion of the flat electrical circuit into the slot and a second position wherein a flexible plate portion of the actuator biases the circuit against the contact portions of the terminals; and

the contact portions of the terminals being elongated and defining opposite ends with contact points therebetween not supported by the housing, the opposite ends of the contact portions being fixed to the housing.

6,015,311

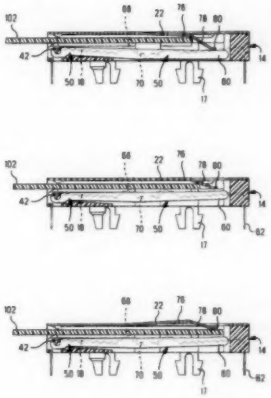
CONTACT CONFIGURATION FOR SMART CARD READER

Karen Elizabeth Benjamin, and John Joseph Consoli, both of Harrisburg, Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Provisional application No. 60/033,658, Dec. 17, 1996. This application Oct. 20, 1997, Appl. No. 954,720.

Int. Cl.[7] H01R *11/22*

U.S. Cl. 439—267 **20 Claims**



1. A smart card reader having a base, a cover secured to the base over a card receiving area, a contact carrier being pivotally attached to the base, a plurality of contacts secured to the base and extending into contact receiving areas of the contact carrier, the cover being characterized by:

a top wall having a first edge proximate a mating end of the base, a pair of side edges proximate side walls of the base, and a rear edge extending between the side edges; and

at least one spring arm having a free end and extending from the top wall into the card receiving area; and

wherein the spring arm and the contact carrier cooperate such that, when a card is not occupying the card receiving area, the free end urges the contact carrier away from the card receiving area, and, when a card is inserted into the card receiving area, the card contacts a portion of the spring arm extending into the card receiving area thereby urging the spring arm to facilitate movement of the contact carrier toward the card receiving area such that the contacts contact the card.

6,015,312

CONNECTOR UNIT

Richard Escane, Orpington, United Kingdom, assignor to A.C. Egerton Limited, Kent, United Kingdom

Filed Dec. 6, 1996, Appl. No. 761,162

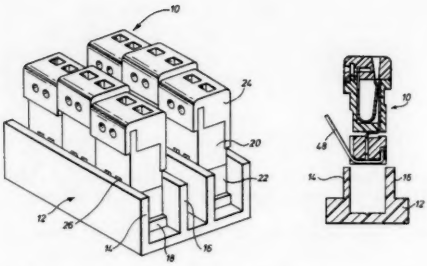
Claims priority, application United Kingdom, Dec. 8, 1995, 9525128; May 17, 1996, 9610396

Int. Cl.[7] H01R *4/24*

U.S. Cl. 439—417 **16 Claims**

1. A connector apparatus, comprising a base unit and a connector module;

the base unit comprising a module receiving means, the module receiving means being for accepting the connector module;



the connector module including at least one IDC connector and a wire receiving means, the IDC connector being for making electrical connection with a wire; and the wire receiving means being for retention of said wire;

wherein the connector module is such that insertion thereof into the base unit causes the IDC connector to move relative to the wire receiving means thereby to make electrical connection between the IDC connector and a wire in the wire receiving means.

6,015,313

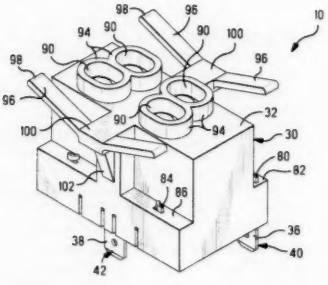
LAMP ASSEMBLY

Wayne Samuel Davis, Harrisburg; Robert Neil Whiteman, Jr., Middletown, and Christopher Scott Leaman, Elizabethtown, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 17, 1997, Appl. No. 877,048

Int. Cl.[7] **H01R** *4/24*

U.S. Cl. 439—419 **28 Claims**



1. A lamp assembly comprising:

an insulative housing having a mounting face and an opposed assembly face and including at least one lamp-receiving aperture extending from said assembly face to entrances along said mounting face;

a lamp insertable into each said at least one lamp-receiving aperture and having a pair of leads; and

a power contact associated with each said lamp and having a terminating section connected to one of said leads, and a common contact associated with the other of said leads and including a terminating section connected thereto, each said power and common contact including a contact section exposed for electrical connection to external power sources for powering said lamps;

each said entrance of said at least one lamp-receiving aperture being at least sufficiently open to permit illumination of a respective lens of a display panel to which the lamp assembly is to be mounted;

said housing including resilient sections coextending from said mounting face to free ends engageable with the panel upon moving of said lamp assembly thereagainst for deflection of said resilient sections, whereafter said resilient sections maintain bias against the panel.

6,015,314

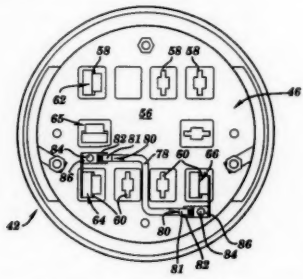
ELECTRIC WATT-HOUR METER ADAPTER

Dennis J. Benfante, East Patchoque, N.Y., assignor to Colsolidated Edison Company of New York, Inc., New York, N.Y.

Filed Nov. 7, 1997, Appl. No. 966,205

Int. Cl.[7] **H01R** *33/945*

U.S. Cl. 439—517 **15 Claims**



1. An adapter for electrically connecting a watt-hour meter and a watt-hour meter socket, said adapter comprising:

a housing;

at least two line apertures formed through said housing;

a line electrical conductor selectively removably inserted through one of said at least two line apertures, said line electrical conductor having a first end configured for being connected to a line contact of said watt-hour meter socket and a second end configured for being connected to said watt-hour meter;

at least two load apertures formed through said housing;

at least two load electrical conductors, each inserted through a respective one of said at least two load apertures, each of said at least two load electrical conductors having a first end configured for being connected to a respective load contact of said watt-hour meter socket, and a second end configured for being connected to said watt-hour meter;

means for electrically connecting said at least two load electrical conductors to each other;

wherein when said watt-hour meter and said watt-hour meter socket are electrically connected to said adapter, energy consumption is measured by said watt-hour meter.

6,015,315

IMPEDANCE IMPROVED COAX CONNECTOR

Lawrence Frank Ensign, Tustin, and Wayde Barry King, Placentia, both of Calif., assignors to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

Filed Nov. 16, 1998, Appl. No. 192,658

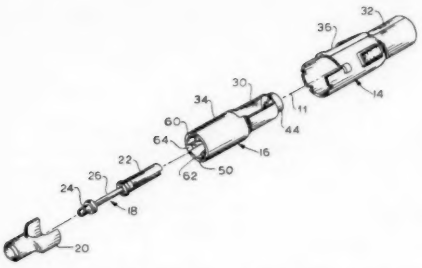
Int. Cl.[7] **H01R** *13/00*

U.S. Cl. 439—578 **7 Claims**

1. A coaxial connector which has an axis, a metal shell with front and rear shell portions of generally cylindrical shape, a center contact lying within said shell and extending along said axis, and an insulator which supports said center contact within said shell, wherein:

said center contact has a front mating end and said shell has a front end that surrounds substantially all of said contact mating end to shield said contact mating end and provide the coaxial connector;

said insulator has a rear insulator portion lying in said rear shell portion, said rear insulator portion having a sleeve-shaped part lying closely within said shell and having at least three axially extending ribs, said ribs extending primarily radially



inwardly from said sleeve-shaped part, with said ribs having radially inner free ends;

said center contact lying closely within said free ends of said ribs, to reduce the amount of solid material of said rear insulator portion and thereby increase the characteristic impedance of the portion of said coaxial connector that surrounds said rear insulator portion.

6,015,316

CIRCUIT BOARD MOUNTED CONNECTOR AND CONTACT USED IN THE SAME

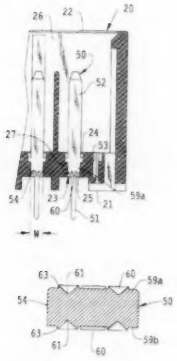
Norihiro Matsubara, Kanagawa, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Apr. 24, 1998, Appl. No. 66,254

Claims priority, application Japan, Mar. 6, 1997, 10-73557; May 16, 1997, 9-143084

Int. Cl.[7] **H01R** *13/405*

U.S. Cl. 439—736 **28 Claims**



1. An electrical connector for mounting onto a circuit board comprising:

a dielectric housing having press-fitting cavities;

electrical contacts having press-fitting sections which are press fitted along a longitudinal axis of each of the contacts into the press-fitting cavities and tine sections for soldered connection to the circuit board; and

recess portions located in surfaces of the press-fitting sections and protruding portions extending outwardly from the surfaces of the press-fitting sections so that when the tine sections are soldered to the circuit board, the housing material in the press-fitting sections will flow into the recess portions and adjacent the protruding portions so as to correspond to the shape of the recess portions and protruding portions, wherein the recess portions are shaped so as to hold and surround a portion of the housing material which has flowed into the recess portions in order to provide a suitable contact retaining force for each of the contacts along a range of axes ranging between the longitudinal axis and a second axis which is substantially perpendicular to the longitudinal axis thereby securely retaining the contacts in the housing.

6,015,317

MARINE ENGINE OVERHEAT DETECTION SYSTEM

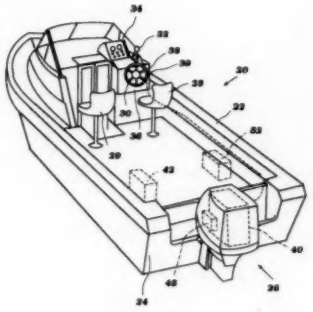
Akihiko Hoshiba, and Kazuhiro Nakamura, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 1, 1998, Appl. No. 108,590

Claims priority, application Japan, Jul. 2, 1997, 9-177438

Int. Cl.[7] **B63H** *21/22*

U.S. Cl. 440—1 **3 Claims**



1. An overheat detection system for an internal combustion engine having at least one combustion chamber, an intake system for supplying air to said combustion chamber and a fuel system for supplying fuel to said combustion chamber for combustion with said air, and a liquid cooling system including at least one coolant jacket into which coolant may be supplied for cooling at least a portion of said engine, said cooling system arranged to drain coolant from said coolant jacket when said engine is not running, said overheat detection system including a sensor for detecting a temperature in said cooling jacket and an overheat determining mechanism receiving an output from said sensor, said mechanism arranged to output an overheat detection signal when a sensed temperature exceeds a predetermine high temperature and means for preventing said signal from being output for a predetermined time after said engine is started to permit coolant to enter said cooling jacket upon restarting without issuing said signal.

6,015,318

HYDRAULIC TILT AND TRIM UNIT FOR MARINE DRIVE

Yoshikatsu Uematsu; Naoyoshi Kuragaki, and Kazuya Takeuchi, all of Shizuoka, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

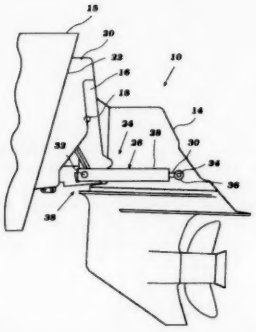
Filed Jan. 20, 1998, Appl. No. 9,043

Claims priority, application Japan, Jan. 17, 1997, 9-006754

Int. Cl.[7] **B63H** *5/12*

U.S. Cl. 440—61 **20 Claims**

1. A tilt and trim adjustment system for an outboard drive comprising at least one actuator connected to the outboard drive, said actuator including first and second chambers, a pump connected to each of the first and second actuator chambers to supply pressurized working fluid to the actuator chambers, a main valve assembly arranged between the actuator and the pump and selectively placing the pump in communication with at least one of the actuator chambers, a bypass line interconnecting the first and second chambers independent of the main valve assembly, and a bypass valve assembly communicating with the bypass line and with at least the first actuator chamber and being operated between at least three operational states, the bypass valve assembly in a first operational state opening the bypass line to permit fluidic commu-



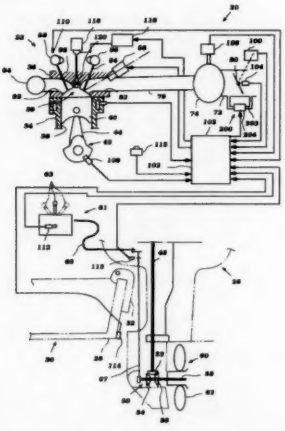
nication between the first and second actuator chambers, the first operational state being established by fluidic pressure supplied by the pump to the first actuator chamber, the bypass valve assembly in a second operational state closing the bypass line to allow working fluid to flow from the first actuator chamber to the pump, said second operational state being established by fluidic pressure supplied by the pump to the second actuator chamber, and the bypass valve assembly in a third operational state inhibiting the flow of working fluid through the bypass valve assembly when the pump is inactive.

6,015,319

CONTROL FOR MARINE PROPULSION

Ko Tanaka, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 18, 1997, Appl. No. 992,880
Claims priority, application Japan, Dec. 18, 1996, 8-338441
Int. Cl.[7] B60K *41/00*
U.S. Cl. 440—84 **22 Claims**



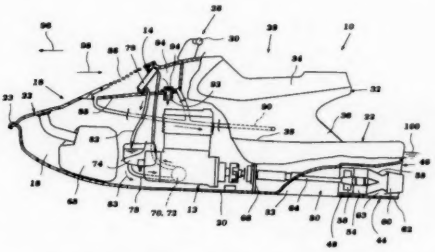
1. An engine control system for an internal combustion engine for propulsion of an associated watercraft, said engine including an air intake in communication with a combustion chamber of said engine, an air intake adjustment means for altering the amount of air let into said combustion chamber of said engine comprised of first and second independently operated air intake adjustment devices, an operation device controlling a water propulsion device of said watercraft said device movable between a forward, a neutral or a reverse position, a first control means for controlling said first air intake adjustment device based upon the position of said movable operating device, a second control means for controlling said second air intake adjustment device independent of said first control means based upon a set of predetermined conditions.

6,015,320

OIL COOLER FOR WATERCRAFT

Masayoshi Nanami, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Jun. 2, 1997, Appl. No. 867,173
Claims priority, application Japan, May 31, 1996, 8-161116
Int. Cl.[7] B63H *21/10*
U.S. Cl. 440—88 **41 Claims**



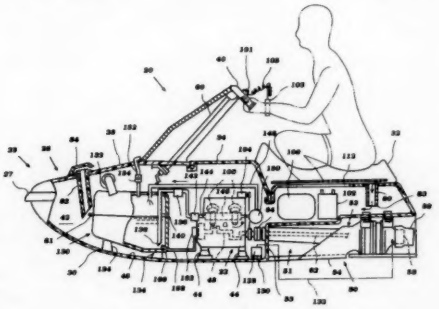
1. A small watercraft comprising a hull with an engine compartment, an internal combustion engine mounted in the engine compartment and including a crankcase, a water propulsion device powered by the internal combustion engine, and a lubrication system including a pump device, a lubrication cooler and a reservoir, the lubrication system communicating with the engine so as to supply lubricant thereto with the pump device circulating lubricant between the engine, the lubrication cooler, and the reservoir, the reservoir being disposed apart from the crankcase of the engine.

6,015,321

FUEL PUMP MOUNTING ARRANGEMENT FOR PERSONAL WATERCRAFT

Sigeyuki Ozawa, and Ryoichi Nakase, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 29, 1997, Appl. No. 998,643
Claims priority, application Japan, Dec. 28, 1996, 8-359049
Int. Cl.[7] B63H *21/32*
U.S. Cl. 440—88 **10 Claims**



1. A watercraft having a hull defining an engine compartment and having a lower surface, said watercraft including a water propulsion device, an internal combustion engine positioned in said engine compartment and supported by said lower surface of said hull, said engine having an output shaft arranged to drive said

water propulsion device, said watercraft having an air intake system for supplying said engine with air for use in a combustion process and for ventilating said engine compartment, said intake system including at least one air intake through said hull leading into and terminating at an air discharge point within said engine compartment, said watercraft including a fuel supply system for supplying fuel from a fuel supply to said engine for combustion, said fuel supply system including an electrically powered fuel pump for delivering fuel from said fuel supply to said engine, said fuel pump positioned within said engine compartment in a location avoiding exposure of said pump to water which enters said engine compartment through said hull by positioning said fuel pump in one of a location vertically above both the water level at which said hull assumes in the water and the air discharge point of said one air intake within said engine compartment and within the interior of said fuel supply below the fuel therein.

6,015,322

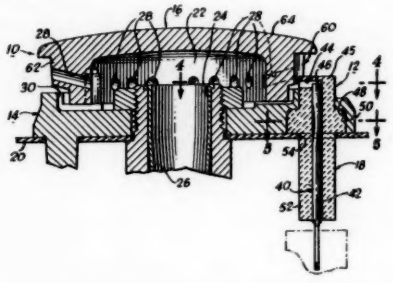
METHOD OF MAKING SPARK IGNITION ELECTRODE ASSEMBLY

David Baker White, Princeton, and Darryl Williams, Plainfield, both of Ill., assignors to Harper-Wyman Company, Aurora, Ill.

Division of application No. 08/931,014, Sep. 15, 1997. This application Nov. 3, 1998, Appl. No. 185,250.

Int. Cl.[7] F23Q *3/00*

U.S. Cl. 445—7 **4 Claims**



1. A method of making a spark ignition electrode assembly for a gas burner comprising the steps of:

forming ceramic material to define an electrically insulative support member having an electrode wire receiving opening for receiving and positioning an electrode wire proximate to the gas burner; said electrically insulative support member including an upper body portion covering said electrode wire and said upper body portion containing a spark ignition passageway for communicating spark ignition discharge between said electrode wire and the gas burner;

inserting said electrode wire in said electrode wire receiving opening; and

firing said formed ceramic material including said inserted electrode wire.

6,015,323

FIELD EMISSION DISPLAY CATHODE ASSEMBLY GOVERNMENT RIGHTS

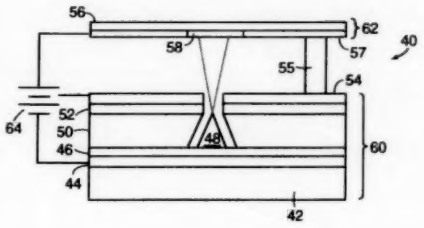
Behnam Moradi; Kanwal K. Raina, and Michael J. Westphal, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 3, 1997, Appl. No. 775,964

Int. Cl.[7] H01J *9/02*

U.S. Cl. 445—24 **39 Claims**

1. In a cathode assembly having a first layer of conductive material located over a baseplate, a method comprising:



forming a layer of insulating material over the first layer of conductive material;

forming a buffer layer over said layer of insulating material;

and forming a second layer of conductive material over said buffer layer,

wherein said buffer layer is a metal layer including a material selected from the group consisting of copper and aluminum.

6,015,324

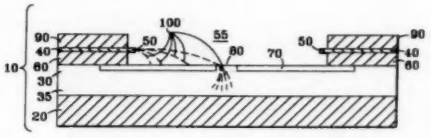
FABRICATION PROCESS FOR SURFACE ELECTRON DISPLAY DEVICE WITH ELECTRON SINK

Michael D Potter, Churchville, N.Y., assignor to Advanced Vision Technologies, Inc., W. Henrietta, N.Y.

Provisional application No. 60/033,787, Dec. 30, 1996, Provisional application No. 60/033,788, Dec. 30, 1996. This application Nov. 5, 1997, Appl. No. 964,987.

Int. Cl.[7] H01J *9/00*

U.S. Cl. 445—24 **20 Claims**



1. A process for fabricating an electron field-emission device comprising the steps of:

a) providing a conductive substrate;

b) disposing a base layer on said conductive substrate, said base layer comprising a phosphor, or a precursor substance that can be converted to a phosphor by heat treatment;

c) disposing an etch-stop layer over said base layer;

d) patterning said etch-stop layer to form at least one first opening for an electron sink;

e) disposing a first insulator layer over said etch-stop layer;

f) disposing and patterning a conductive material to form an emitter layer of only a few hundred angstroms thickness over said first insulator layer;

g) disposing a second insulator layer over said emitter layer;

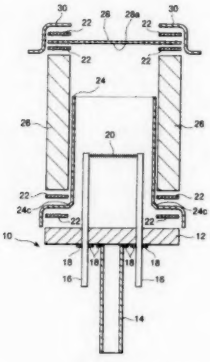
h) etching a second opening through said emitter layer and said first and second insulator layers while leaving said etch-stop layer substantially un-etched;

i) heating at least said base substance and etch-stop layer at a suitable temperature for a suitable time to form a composite material, thus forming an anode having at least one electron sink at said at least one first opening and completing the electron field-emission device.

6,015,325
METHOD FOR MANUFACTURING TRANSMISSION TYPE X-RAY TUBE

Tsutomu Inazuru, and Kenji Suzuki, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka, Japan

Filed Jul. 10, 1998, Appl. No. 113,372
Int. Cl.[7] H01J *9/00*
U.S. Cl. 445—28 **5 Claims**



1. A method for manufacturing an X-ray tube comprising the steps of:

a stem unit assembly process wherein a pair of cathode pins are inserted through a high-temperature brazing material into respective cathode pin holes formed on a bottom plate making up a stem unit;

a high-temperature brazing process wherein the stem unit assembled in the stem unit assembly process is heated to a brazing temperature of the high-temperature brazing material used in the stem unit;

an X-ray tube assembly process wherein a focusing electrode, a ceramic bulb, and an output window are placed over the stem unit with a low-temperature brazing material interposed between the bottom plate and the focusing electrode, between the focusing electrode and the ceramic bulb, and between the ceramic bulb and the output window to assemble the X-ray tube; and

a low-temperature brazing process wherein the X-ray tube assembled in the X-ray tube assembly process is heated to a brazing temperature of the low-temperature brazing material used in the X-ray tube assembly, the brazing temperature of the low-temperature brazing material being lower than the brazing temperature of the high-temperature brazing material.

6,015,326
FABRICATION PROCESS FOR ELECTRON FIELD-EMISSION DISPLAY

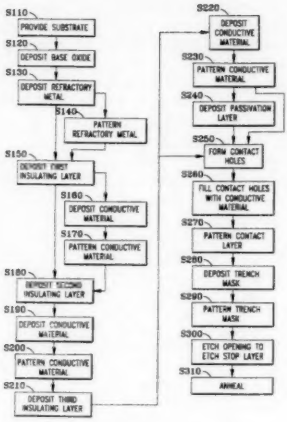
Michael D Potter, Scottsville, N.Y., assignor to Advanced Vision Technologies,Inc., W. Henrietta, N.Y.

Provisional application No. 60/025,550, Sep. 3, 1996, Provisional application No. 60/025,555, Sep. 3, 1996, Provisional application No. 60/025,556, Sep. 3, 1996, Provisional application No. 60/032,197, Dec. 2, 1996, Provisional application No. 60/032,199, Dec. 2, 1996, Provisional application No. 60/032,201, Dec. 2, 1996. This application Jul. 28, 1997, Appl. No. 900,915.
Int. Cl.[7] H01J *9/14*
U.S. Cl. 445—52 **20 Claims**

1. An integrated etch stop and phosphor-forming fabrication process comprising the steps of:

a) depositing a base layer of a first phosphor,

b) depositing a refractory metal etch stop layer, and

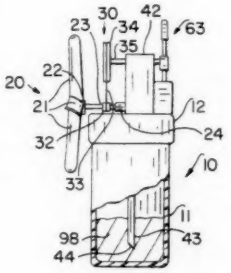

S110 PROVIDE SUBSTRATE
S120 DEPOSIT BASE OXIDE
S130 DEPOSIT REFRACTORY METAL
S140 PATTERN REFRACTORY METAL
S150 DEPOSIT FIRST INSULATING LAYER
S160 DEPOSIT CONDUCTIVE MATERIAL
S170 PATTERN CONDUCTIVE MATERIAL
S180 DEPOSIT SECOND INSULATING LAYER
S190 DEPOSIT CONDUCTIVE MATERIAL
S200 PATTERN CONDUCTIVE MATERIAL
S210 DEPOSIT THIRD INSULATING LAYER
S220 DEPOSIT CONDUCTIVE MATERIAL
S230 PATTERN CONDUCTIVE MATERIAL
S240 DEPOSIT PASSIVATION LAYER
S250 FORM CONTACT HOLES
S260 FILL CONTACT HOLES WITH CONDUCTIVE MATERIAL
S270 PATTERN CONTACT LAYER
S280 DEPOSIT TRENCH MASK
S290 PATTERN TRENCH MASK
S300 ETCH OPENING TO ETCH STOP LAYER
S310 ANNEAL

c) annealing to combine at least a portion of said base layer with at least a portion of said refractory metal etch stop layer to form a second phosphor.

6,015,327
WIND POWERED BUBBLE MAKING DEVICE

Ernest David Kovacs, 219 Mortani Point, East Palatka, Fla. 32131

Filed Sep. 29, 1998, Appl. No. 163,059
Int. Cl.[7] A63H *33/28*
U.S. Cl. 446—15 **14 Claims**



1. A wind-powered bubble making device comprising:

(A) a rotating wand assembly and a wind-powered fan assembly connected to means to transfer rotation from said fan assembly to said rotating wand assembly, such that rotation of said fan assembly causes the wand assembly to rotate, said wand assembly having a plurality of wands for forming bubbles;

(B) a generally closed fluid reservoir assembly containing bubble-making fluid;

(C) applicator means to apply said bubble-making fluid to said wands;

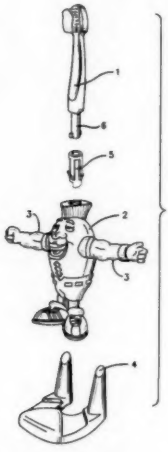
(D) pumping means to deliver said bubble-making fluid from said reservoir assembly to said applicator means, where said pumping means is powered by said fan assembly.

6,015,328

TOOTHBRUSH TOY HAVING INTERCHANGEABLE BENDABLE AND POSABLE CHARACTER HANDLES

Robert Glaser, 23800 Commerce Park #D, Cleveland, Ohio 44122-5828

Filed Sep. 25, 1995, Appl. No. 533,287
Int. Cl.[7] A46B *9/04*
U.S. Cl. 446—72 **5 Claims**



1. A bendable and posable toothbrush toy comprising a toothbrush portion having a longitudinal axis and being detachably secured to a handle portion, said handle portion being formed at least in part from a resilient material and having portions that are posable relative to remaining portions of said handle portion and said toothbrush portion in at least a plane perpendicular to said longitudinal axis, to assume a variety of changeable configurations of said toothbrush, wherein said handle portion is in the form of an animate character having limbs extending at an angle relative to said longitudinal axis, said limbs being posable relative to said remaining portions, and wherein said toothbrush portion is secured to said handle portion by a twist-and-lock connection comprising a male connection formed integrally with said toothbrush portion and having at least one radially outwardly extending projection, and a cylindrical socket disposed in said handle portion having at least one axial groove for receiving said at least one projection, said at least one axial groove communicating with an inclined surface defined by a cut-out portion of said cylindrical socket and cooperating with said at least one projection to releasably secure said toothbrush portion to said handle portion, said cylindrical socket further comprising at least one axial abutment restricting said toothbrush portion to rotation in only one direction upon being inserted into said cylindrical socket.

6,015,329

TOY VEHICLE LOGGING MILL ACCESSORY

Will Isaksson, New York, N.Y.; Donald Edward Toht, Wheaton, and Jeffry Han Katz, Chicago, both of Ill., assignors to Learning Curve International Inc., Chicago, Ill.

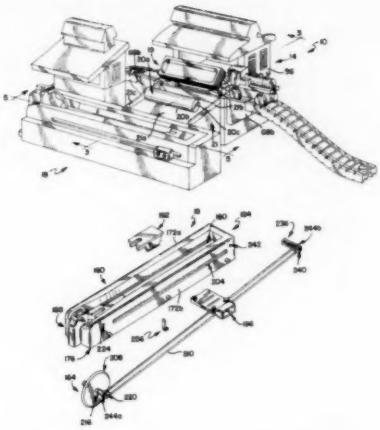
Filed Jan. 28, 1998, Appl. No. 14,500
Int. Cl.[7] A63H *33/30;* **B23D** *25/00;* **B65F** *5/00*
U.S. Cl. 446—424 **15 Claims**

1. For a toy vehicle set accessory, a saw mill for separating a toy log, the saw mill, comprising:

a mill housing having a log receiving end and a cutting end;

a presevered toy log adapted to fit within the mill housing, the presevered toy log including a plurality of log segments separably joined along a sectioning plane;

a saw member positioned at the cutting end; and,



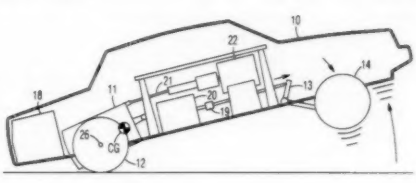
means for providing relative transverse movement to the presevered toy log from the log receiving end to the cutting end, wherein when the presevered toy log is moved to the cutting end, the presevered toy log contacts and is separated by the saw member.

6,015,330

HOPPING MODEL CAR

Donald Simmons, 8032 Ney Ave., Oakland, Calif. 94605, and Larnell Simmons, 3236 Martin Luther King, Jr. Way, Oakland, Calif. 94609

Filed Sep. 18, 1998, Appl. No. 156,942
Int. Cl.[7] A63H *17/00*
U.S. Cl. 446—437 **20 Claims**



1. A hopping model car, comprising:

a body;

a pair of vertically adjustable rear wheels mounted near a rear end of said body, said rear wheels being adjustable between an upwardly retracted position and a downwardly extended position relative to said body;

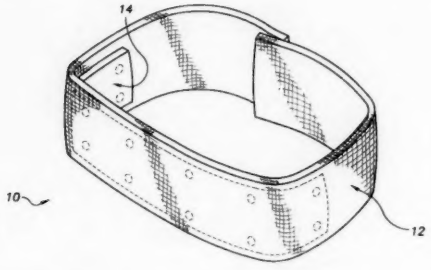
a pair of vertically movable front wheels mounted near a front end of said body, said front wheels being movable between an upwardly retracted position and a downwardly extended position relative to said body; and

an actuator connected to said front wheels, said actuator extending said front wheels downwardly from said retracted position to said extended position, thus propelling said front end of said body upwardly into the air, further, said rear wheels can be adjusted downwardly to raise said rear end of said body, thus enabling said front end to be propelled higher without having said rear end bottom out.

6,015,331
NIGHTTIME NURSING TUBE BRA

Debbie M. Ioakim, 6282 Pine Terrace Cir., Milton, Fla. 32570

Filed Apr. 29, 1998, Appl. No. 67,984
Int. Cl.[7] A41C *3/00*
U.S. Cl. 450—37 1 Claim



1. A nighttime nursing tube bra securable about breasts of a wearer comprising:

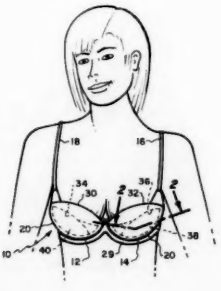
a tubular bra member having a forward central portion including a first elastomeric band along a top edge, a second elastomeric band along a bottom edge and a first number of spaced hook and pile fastener sections spaced along a perimeter of an interior surface thereof; and

a liner member sized and shaped to conform to said forward central portion, said liner member being constructed from an absorbent, launderable fabric, and including a second number of hook and pile faster sections spaced about said liner member perimeter thereof, said first and second numbers of hook and pile fastener sections being securable together to attach said liner member to said interior surface of said forward central portion.

6,015,332
PUSH-UP BRA PAD

Chih-Jung Lee, and Judy Lee, both of Monterey Park, Calif., assignors to Ce Soir Lingerie Co., Inc., Ventura, Calif.

Filed Aug. 11, 1998, Appl. No. 132,572
Int. Cl.[7] A41C *3/10*
U.S. Cl. 450—57 12 Claims

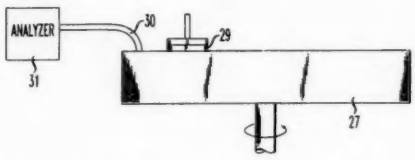


1. A pad for a push-up bra comprising a flexible, sealed envelope formed of a film of tough, synthetic resin, resistant to puncture capable of permeation of water through the film at body temperature, said envelope containing a liquid consisting essentially of a mixture of 10–60% by weight water; the remainder being an organic hygroscopic agent miscible with water capable of drawing water vapor from outside the envelope through the film into the envelope.

6,015,333
METHOD OF FORMING PLANARIZED LAYERS IN AN INTEGRATED CIRCUIT

Yaw Samuel Obeng, Orlando, Fla., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Division of application No. 08/769,717, Dec. 18, 1996, Pat. No. 5,836,805. This application Aug. 17, 1998, Appl. No. 135,260.
Int. Cl.[7] B24B *49/00*
U.S. Cl. 451—8 3 Claims



1. A method of polishing an integrated circuit comprising:

polishing a wafer having an overlying layer of dielectric with a polishing slurry and a polishing pad;

removing the polishing slurry from the pad to form a waste slurry;

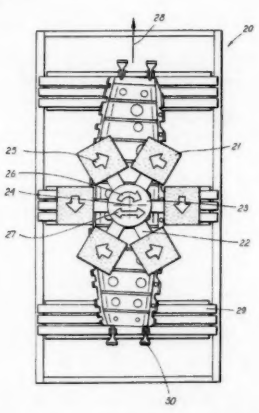
measuring a physical property of said waste slurry; and

terminating said polishing operation after said physical property reaches a predetermined value.

6,015,334
METHOD FOR THE DEBURRING OF ITEMS, PARTICULARLY ITEMS OF METAL, AND USE OF THE METHOD

Keld Otting Hundebøl, Ansager, Denmark, assignor to HH Patent A/S, Ansager, Denmark

PCT No. PCT/DK97/00326, § 371 Date Mar. 23, 1998, § 102(e) Date Mar. 23, 1998, PCT Pub. No. WO98/05472, PCT Pub. Date Feb. 12, 1998
PCT Filed Aug. 5, 1997, Appl. No. 43,540
Claims priority, application Denmark, Aug. 5, 1996, 0830/96
Int. Cl.[7] B24B *7/00*
U.S. Cl. 451—28 5 Claims



1. A method for deburring metal items which have sharp edges or burrs comprising:

providing a deburring tool having a number of deburring rollers composed of a plurality of deburring disks, each deburring disk consisting of a circularly-cut piece of abrasive material provided with radial slits to form a large number of deburring fingers, said deburring disks being secured on a plurality of spindle axles which extend radially outwards to form a drive, said deburring rollers being rotated around the spindle axles,

said spindle axles being turned around a turning axle which extends at a right-angle to the spindle axles; and

feeding the items under the deburring tool which sweeps the surface of the items and moving the drive with the spindle axles in a reciprocating manner in a direction transverse to the feeding direction of the items.

6,015,335

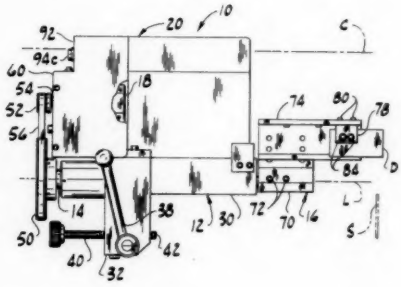
APPARATUS FOR DRESSING INSIDE DIAMETER SAWS

Russell Bradley Roberts, Simpsonville, S.C., assignor to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Dec. 17, 1997, Appl. No. 991,962

Int. Cl.[7] B24B *53/00*

U.S. Cl. 451—72 **9 Claims**



1. Portable apparatus for dressing the cutting surfaces around a central opening of an annular inside diameter saw, said apparatus comprising:

a base;

a shaft mounted on the base for rotation on a longitudinal axis of the shaft, said shaft being adapted to be positioned adjacent the central opening of the saw;

a fixture mounted on the shaft for holding a dressing stone in the central opening of the saw; and

a motor operatively connected to the shaft for rotating the shaft about the longitudinal axis to move the dressing stone held by the fixture along an arc centered on the longitudinal axis of the shaft into engagement with the cutting surfaces of the saw when the saw is rotating thereby to remove deposits from the cutting surfaces of the saw.

6,015,336

GRINDING APPARATUS

Osamu Kubota; Katsunori Arai; Yuji Sato; Takayuki Yui, and Toshihisa Kanakubo, all of Matsuyama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Nov. 23, 1998, Appl. No. 197,414

Claims priority, application Japan, May 26, 1998, 10-161456

Int. Cl.[7] B24B *1/00;49/00*

U.S. Cl. 451—251 **8 Claims**

1. A grinding apparatus for grinding a work having a plurality of non-circular work faces to be worked with a grindstone driven by a motor, the work faces being disposed at intervals, said apparatus comprising;

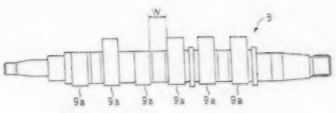
a grindstone unit having a grinding wheel with a radius thereof smaller than that of an arc defining a shape of each work face;

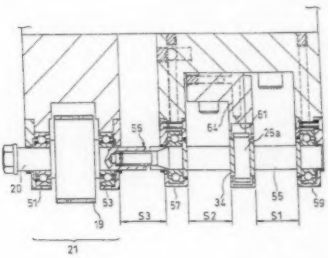
a driving shaft connected to a shaft of the grinding wheel;

a gear train for transmitting a driving force of the motor to said driving shaft; and

a bearing for said driving shaft;

characterized in that distances between, said grindstone unit, said bearing and said gear train which are adjacent to each





other are substantially equal to a distance between adjacent work faces of said work.

6,015,337

POLISHING APPARATUS

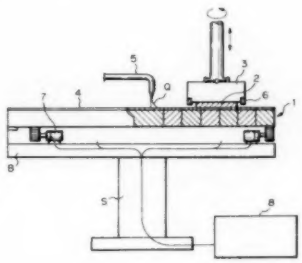
Hirokuni Hiyama, Tokyo, and Yutaka Wada, Kanagawa-ken, both of Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of application No. 08/683,421, Jul. 18, 1996, abandoned. This application Jul. 14, 1997, Appl. No. 891,993.

Claims priority, application Japan, Jul. 20, 1995, 7-206591

Int. Cl.[7] B24B *5/00;29/00*

U.S. Cl. 451—288 **11 Claims**



1. A polishing apparatus including a turntable with an upper polishing surface, and a top ring for pressing a surface of a workpiece to be polished against said polishing surface with a predetermined pressure while moving said turntable and said top ring relative to each other, said turntable comprising:

at least three coaxially disposed small platens including a central disc-shaped small platen and at least two annular small platens coaxially surrounding said disc-shaped small platen; and

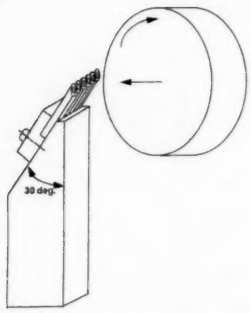
each said small platen having a width in a radial direction thereof that is smaller than a diameter of the surface of the workpiece to be polished and is of a dimension such that during a polishing operation the surface of the workpiece to be polished is polished by at least three of said small platens.

6,015,338

ABRASIVE TOOL FOR GRINDING NEEDLES

Keith C. Hong, Brookline; Patrick E. Dwyer, Shrewsbury; Elinor B. Keil, Worcester; Edward Lambert, Westboro, and Fershid Aspi, Boston, all of Mass., assignors to Norton Company, Worcester, Mass.

Filed Aug. 28, 1997, Appl. No. 919,871
Int. Cl.[7] B24D *3/28*
U.S. Cl. 451—541 **11 Claims**



1. A self-dressing abrasive tool comprising phenolic resin, 240 to 800 grit abrasive grain, hollow ceramic spheres, and powdered filler, wherein the abrasive tool is manufactured by a process comprising the steps:

a) blending the phenolic resin, the abrasive grain, hollow ceramic spheres and the powdered filler to form a mixture;

b) pressing the mixture in a mold to form an uncured abrasive tool;

c) heating the uncured abrasive tool to about 155 to 165° C. and holding the uncured abrasive tool at 155 to 165° C. for 6 to 12 hours to form an intermediate bonded abrasive tool; and

d) heating the intermediate bonded abrasive tool to a maximum temperature of at least 175° C. and holding the abrasive tool at maximum temperature for 6 to 12 hours to embrittle the bond and form the abrasive tool, and

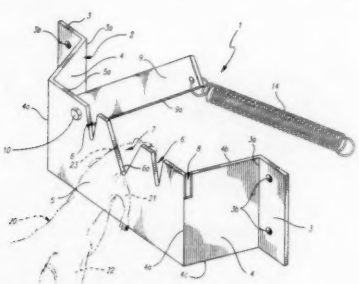
wherein the abrasive tool effectively grinds cannulae to form needle tips which are substantially free of burrs.

6,015,339

CLAMPING DEVICE FOR SKINNING GAME

Brian T. Lochbrunner, 1219 Ward 3 School Rd., and Tom I. C. P. Lochbrunner, 190 Hwy. 160, both of Winnsboro, La. 71295

Provisional application No. 60/113,959, Dec. 28, 1998. This application Jan. 11, 1999, Appl. No. 229,515.
Int. Cl.[7] A22B *5/16*
U.S. Cl. 452—187 **13 Claims**



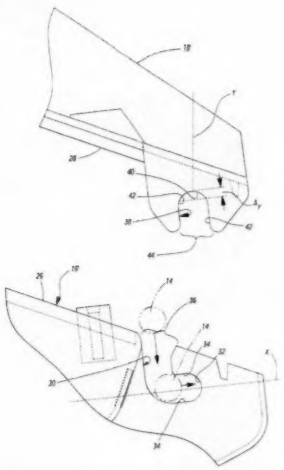
1. A clamping device for securing a game carcass for skinning, said clamping device comprising a bracket for receiving the game carcass; a clamp carried by said bracket for engaging the game carcass and securing the game carcass in said bracket; and a latch carried by said clamp for selectively engaging said bracket and securing said clamp on the game carcass.

6,015,340

METHOD FOR ASSEMBLING SHAFT OF ROTATING VALVE DOOR BETWEEN A PAIR OF HOUSINGS

Ardeean Scoccia, Amherst, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1997, Appl. No. 992,680
Int. Cl.[7] B60H *1/24*
U.S. Cl. 454—69 **1 Claim**



1. A method for assuring a close fitting, non binding, capture of a cylindrical shaft end between a pair of housings of an automotive heating and air conditioning case that are assembled by being moved into abutment along a predetermined direction, comprising the steps of:

determining a nominal assembled location for the circumference of said rotating shaft end relative to said housings,

determining a first manufacturing tolerance range in the nominal location of said shaft end circumference oriented perpendicularly to said predetermined direction of assembly and a second manufacturing tolerance range oriented along said predetermined direction of assembly,

providing a first capture slot in one of said housings oriented perpendicularly to the direction of assembly, said first capture slot having an open entry end, a closed end, and a pair of straight edges at least as long as the diameter of said shaft end and spaced apart by substantially the diameter of said shaft end, with the closed end of said first capture slot having a clearance from the nominal assembled location of the circumference said shaft end at least equal to half of said predetermined first tolerance range,

providing a second capture slot in the other of said housings oriented along the direction of assembly, said second capture slot having an open entry end facing away from its respective housing edge, a closed end, and a pair of straight edges at least as long as the diameter of said shaft end and spaced apart by substantially the diameter of said shaft end, with the closed end of said second capture slot having a clearance from the nominal assembled location of the circumference of said shaft end at least equal to half of said predetermined second tolerance range,

inserting said shaft end into one of said capture slots, and,

moving said housings into abutment, thereby moving the other of said capture slots over said shaft end, after which said shaft

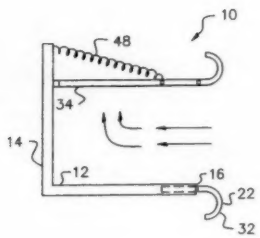
end is tangentially contacted at two pairs of diametrically opposed points by said four slot straight edges, with manufacturing tolerance variations in the assembled location of said shaft end in either direction along said direction of assembly and in either direction perpendicular thereto being accommodated by the two open ends and of said capture slots and by the two slot closed end clearances, so that said shaft end is closely captured regardless of tolerance variations and without binding in said slots.

6,015,341

AIR FLOW DIVERTER

Abdul-Razzak Faraj, P.O. Box 566068, Atlanta, Ga. 31156

Filed Nov. 25, 1998, Appl. No. 200,486
Int. Cl.[7] B60H *1/34*
U.S. Cl. 454—307 **4 Claims**



1. A device for diverting air flow upward from an air outlet of an air conditioning system, said air outlet having a top, a bottom, a left side and a right side, said device comprising:

an airfoil having a bottom portion extending laterally and horizontally and a top portion extending laterally and vertically said bottom portion terminating at a bottom edge face and defining a left opening and a right opening, said openings extending horizontally from said bottom edge face inward toward said top portion;

a bottom connector having base member, a left pin extending from said base member adapted to engage said left opening, a right pin extending from said base member adapted to engage said right opening, a left hook extending from said base member adapted to engage said left side of said air outlet, and a right hook extending from said base member adapted to engage said right side of said air outlet,

a top connector having a left rail pivotally connected to said top portion of said air foil, a left hook extending from said left rail adapted to engage said top of said air outlet, a right rail pivotally connected to said top portion of said air foil, a right hook extending from said right rail adapted to engage said top of said air outlet, and a cross member fastened to said left and right rails and extending between said left and right rails; and

a coil spring having one end attached to said top potion of said air foil at a higher elevation than said top connector and having its other end attached to said cross member to bias said left and tight hooks of said top connecting member upward.

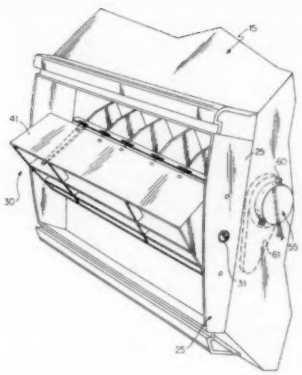
6,015,342

LOUVER APPARATUS FOR AIR CONDITIONING UNIT

Richard D. Dennis, Bridgeport, N.Y., assignor to Carrier Corporation, Farmington, Conn.

Filed Jun. 3, 1998, Appl. No. 89,802
Int. Cl.[7] F24F *7/00*
U.S. Cl. 454—316 **4 Claims**

1. Apparatus for deflecting conditioned air that is being discharged from an air conditioning unit into a comfort zone that includes:



an air conditioner cabinet that contains a duct through which conditioned supply air is discharged into a comfort zone;

a stationary outer frame mounted within said duct;

a movable inner frame pivotally supported within the outer frame so that said inner frame rotates about a horizontal axis;

an incrementally positionable motor mounted in said cabinet having a drive shaft;

a lever arm connected at one end to said drive shaft; the movable frame, the operable length of the link being adjustable so that the motion of the inner frame can be regulated within a given range on motion;

louver means mounted within said inner frame for deflecting the flow of air passing therethrough; and

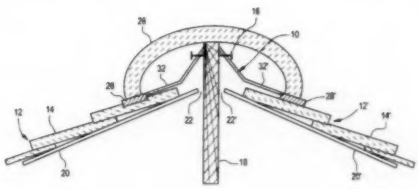
control means for remotely controlling the motor to selectively position said inner frame within said given range of motion.

6,015,343

TILE ROOF VENT

Richard Castillo, San Jose, Calif.; Ravinder Nair, Warren, N.J.; Krishna Srinivasan, Mahwah, N.J., and Edward C. Villela, Leonia, N.J., assignors to Building Materials Corporation of America, Wayne, N.J.

Filed Dec. 2, 1998, Appl. No. 204,438
Int. Cl.[7] F24F *7/02*
U.S. Cl. 454—365 **44 Claims**



1. A tile roof vent for covering the ridge or roof to wall area of an undulating flat through high profile tile roof, said ridge or roof to wall area having an opening therein for allowing ventilation of static air from an attic space of a building, said tile roof vent comprising:

two unitary panels positioned over said opening, said panels being spaced from and projecting a mirror image of each other, wherein each of said panels comprises:

a) a hard plastic sheet having a lower portion; and an upper portion which is integral with said lower portion, said lower portion having a stiffener therein; and

b) a sinusoidally shaped air-permeable fibrous mat on the underside of said lower portion of the hard plastic sheet;

wherein ridge tiles covering said tile roof vent are being supported at their leading edge by said lower portions of said hard plastic sheet and a ridge board at the centers thereof.

6,015,344

PRIZE REDEMPTION SYSTEM FOR GAMES

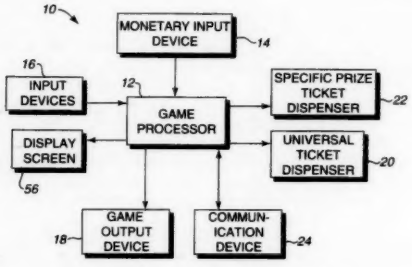
Matthew F. Kelly, San Ramon; Bryan M. Kelly, Almo; Norman B. Petermeier, Saratoga; John G. Kroeckel, San Ramon, and John E. Link, Tracy, all of Calif., assignors to RLT Acquisition, Inc., Pleasanton, Calif.

Continuation-in-part of application No. 08/628,490, Apr. 5, 1996, abandoned, which is a continuation-in-part of application No. 08/746,755, Nov. 14, 1996, Pat. No. 5,816,918. This application Sep. 29, 1997, Appl. No. 938,461.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06F** *15/00*

U.S. Cl. 463—16 **105 Claims**



1. A method for providing a redemption system for players of a game apparatus, said method comprising:

providing a game on said game apparatus for a player to play, wherein said player plays said game in exchange for monetary input from said player to said game apparatus;

providing a number of prize credits for said player based on an outcome of said game, wherein said outcome of said game is influenced by skill of said player;

providing a prize selection menu for said player, said prize selection menu displaying at least one prize selectable by said player; and

receiving an indication of a selection of a prize by said player, said indication resulting from input by player using an input device of said game apparatus, wherein said selected prize is provided to said player after said indication is received.

6,015,345

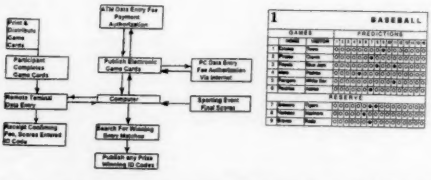
CONDUCTING GAMES OF CHANCE USING PREDICTED SUM OF SCORES

Gianni Kail, Turin, Italy, assignor to Supra Engineering Limited, Tortola, Virgin Islands (Br.)

Continuation-in-part of application No. 08/950,243, Oct. 14, 1997. This application Feb. 6, 1998, Appl. No. 20,128.

Int. Cl.[7] **G06F** *15/00*

U.S. Cl. 463—16 **24 Claims**



1. A method of conducting games of chance in conjunction with a plurality of regularly-scheduled sporting events between competing teams for awarding prizes to participants that meet predetermined requirements, the method comprising the steps of:

(a) issuing to participants game cards that identify a plurality of principal team sporting events to be played by a specified time and that include blank delineated spaces that correspond to pre-selected fields of information for the entry of indicia corresponding to the predicted numerical value of the sum of the final scores of the competing teams for each event;

(b) receiving from the participants prior to the specified time, game cards that have the delineated spaces marked with indicia corresponding to the predicted numerical value of the sum of the final scores of the competing teams for each of the events, and the participants' prescribed entry fee;

(c) entering the predicted numerical value of the sum of the final scores of the competing terms indicated on the cards into the memory of a programmed digital computing device in association with a unique data entry transaction code;

(d) issuing to each participant a printed confirmation of the entry of the predicted numerical value of the scores of the competing teams and the data entry transaction code;

(e) entering the actual numerical score value totals from each of the principal sporting events into the memory of the digital computing device;

(f) employing the computing device to identify the data entry transaction code of the score predictions of any participants that meet predetermined requirements for winning a prize; and

(g) publishing the data entry transaction code of any prize-winning score predictions.

6,015,346

INDICIA SELECTION GAME

Nicholas Luke Bennett, Manly Vale, Australia, assignor to Aristocat Leisure Industires Pty. Ltd., Lame Cove, Australia

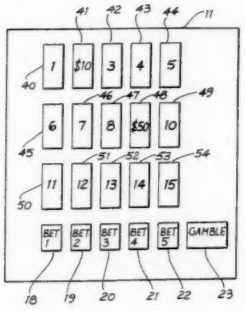
PCT No. PCT/AU97/00044, § 371 Date Jul. 27, 1998, § 102(e) Date Jul. 27, 1998, PCT Pub. No. WO97/27569, PCT Pub. Date Jul. 31, 1997

PCT Filed Jan. 24, 1997, Appl. No. 117,559

Claims priority, application Australia, Jan. 25, 1996, PN 7754

Int. Cl.[7] **A63F** *3/06;9/22*

U.S. Cl. 463—20 **14 Claims**



1. A slot machine including display means arranged to display a game being played on the machine, game initiating means to initiate a game on the machine and game control means responsive to the initiating means to control the playing of the game, characterized in that the display means is arranged to display a plurality of indicia, each indicia being associated with a prize or prize symbol which is initially not displayed, the machine including indicia selection means arranged to allow a player to select at least one pair of indicia, and the control means being arranged to reveal the prize or prize symbol associated with each of the selected pair of indicia and to award a prize to the player in the event that a pair

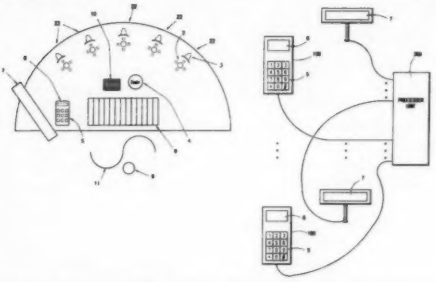
of selected indicia are each associated with the same prize or prize symbol or are associated with a predetermined pair of prizes or prize symbols.

6,015,347

PROGRESSIVE JACKPOT METER AND DISPLAY

Karl Andrew Maahs, Los Lunas, and Dennis Perry Floge, Albuquerque, both of N. Mex., assignors to Explosive Gaming, Inc., Los Lunas, N. Mex.

Filed Dec. 26, 1996, Appl. No. 774,193
Int. Cl.[7] A63F *1/00*
U.S. Cl. 463—27 **8 Claims**



1. Casino gaming apparatus for use with a plurality of progressive jackpots, comprising:

a dealer operated unit at each casino table participating in said plurality of progressive jackpots, said dealer operated unit comprising a keypad for entry of progressive jackpot modification information;

a processing unit for receiving and processing said progressive jackpot modification information to update each of said plurality of progressive jackpot;

at least one display unit coupled to said processing unit for displaying jackpot information for all, of said plurality of progressive jackpots; and

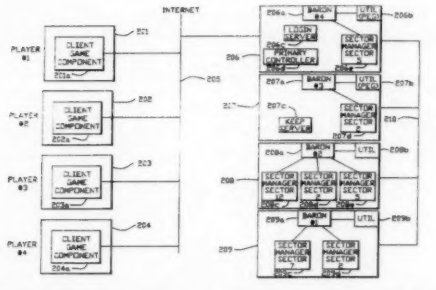
said at least one display unit being a display unit mounted to the top of said casino table such that said display unit is visible from at least all player positions at said casino table.

6,015,348

SCALABLE GAME SERVER ARCHITECTURE

Patrick B. Lambright, Redmond, and David M. Gedye, Seattle, both of Wash., assignors to Starwave Corporation, Bellevue, Wash.

Filed Oct. 18, 1996, Appl. No. 733,578
Int. Cl.[7] A63F *9/22*
U.S. Cl. 463—42 **23 Claims**



12. A system for implementing a multi-player computer game comprising a plurality of sectors, each sector defining a logical area into which players can enter and perform game-related activities, the system comprising:

a plurality of computers coupled via a network;

a primary controller means residing on one computer of the plurality of computers for receiving a player-initiated request to enter a first sector of the plurality of sectors as part of the multi-player computer game;

means, responsive to receiving a request to implement said first sector, for spawning on a first computer of the plurality of computers a first process that implements said first sector on the first computer and, responsive to receiving the request to implement said first sector, for spawning on a second computer of the plurality of computers a second software process that implements said first sector on the second computer;

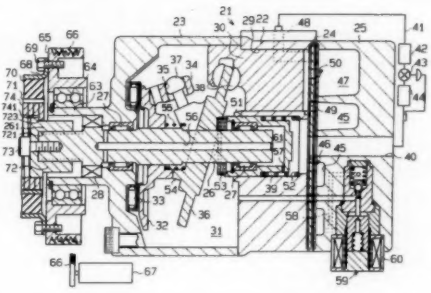
wherein the primary controller means, upon receiving the player-initiated response, determines on the basis of computer loading information for the first and second computers which of the first and second computers should implement said first sector and, upon making the determination, issues the request to implement said first sector on the first computer if the first computer has more favorable computer loading characteristics, and issues the request to implement said first sector on the second computer if the second computer has more favorable computer loading characteristics.

6,015,349

POWER TRANSMISSION MECHANISM FOR COMPRESSORS

Masahiko Okada; Takashi Ban; Tatsuya Hirose; Kiyoshi Yagi; Tatsuyuki Hoshino; Hidefumi Mori; Takanori Okabe, and Nobuaki Hoshino, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi-ken, Japan

Filed May 15, 1998, Appl. No. 79,667
Claims priority, application Japan, May 16, 1997, 9-127325
Int. Cl.[7] F16D *19/00;27/00;37/02*
U.S. Cl. 464—31 **27 Claims**



1. An apparatus for transmitting rotational power from a driving body to a driven body, said apparatus comprising:

a resilient member coupled to one of the driving body and the driven body;

a deformable member coupled to the other one of the driving body and the driven body, said deformable member being deformable by heat; and

a contact member interposed between the resilient member and the deformable member, said contact member having a rigidity greater than that of the deformable member,

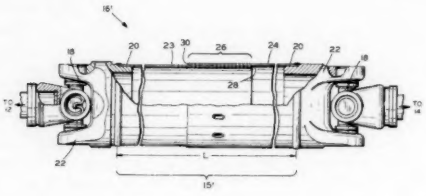
said resilient member and said contact member being in forcible abutment with each other by means of force exerted by the resilient member, said deformable member and said contact member being in abutment with each other, and

said resilient member and said contact member frictionally contacting one another to generate the heat that deforms the deformable member when load generated in the driven body is in excess of a predetermined value.

6,015,350
COLLAPSIBLE VEHICLE DRIVESHAFT

Douglas E. Breese, Northwood, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 3, 1997, Appl. No. 984,212
Int. Cl.[7] F16C *3/03*
U.S. Cl. 464—162 **11 Claims**



1. A driveshaft assembly comprising:

an inner member having an end;

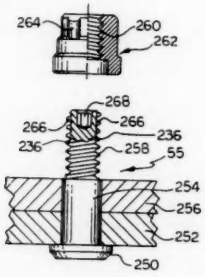
an outer tube having an end that is disposed about said end of said inner member so as to define an overlapped region; and

at least one crimp formed in said inner member and said outer tube to prevent relative axial and rotational movement between said inner member and said outer tube without deformation of either of said inner member and said outer tube and to allow relative axial movement between said inner member and said outer tube with deformation of either or both of said inner member and said outer tube.

6,015,351
FIVE SPINDLE FLUTING MACHINE

Robin William Elcock, Torrance; Albert K. Yamamoto, Huntington Beach, and John A. Louw, Rancho Palos Verdes, all of Calif., assignors to Fairchild Holding Corp., Torrance, Calif.

Division of application No. 08/951,925, Oct. 16, 1997, Pat. No. 5,906,537, which is a division of application No. 08/536,647, Sep. 29, 1995, Pat. No. 5,716,280. This application Aug. 19, 1998, Appl. No. 136,024.
Int. Cl.[7] B21H *3/02*
U.S. Cl. 470—10 **9 Claims**

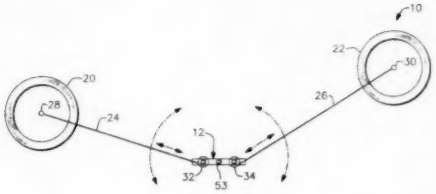


1. A threaded pin fastener having a plurality of flutes fabricated by first forming threads on the pin and then simultaneously grinding flutes on the pin.

6,015,352
GOLF TRAINING DEVICE FOR CHIP SHOTS

Douglas Leopold, Clearwater, and John T. D'Ambra, Gulfport, both of Fla., assignors to D.J. Damapold, Inc., Clearwater, Fla.

Filed Dec. 31, 1997, Appl. No. 1,346
Int. Cl.[7] A63B *69/36*
U.S. Cl. 473—172 **8 Claims**



1. An apparatus for practicing chip shots in the game of golf, comprising:

a base member of predetermined geometric configuration;

mounting means for securing said base member to a ground surface;

a first reel means and a second reel means rotatably mounted to said base member;

a first cord and a second cord, each having an elongate length, said first cord being wound about said first reel means and said second cord being wound around said second reel means;

a first remote target means and a second remote target means, said first target means associated with said first cord and said second remote target means associated with said second cord, each remote target means of said first and second remote target means circumscribing a first preselected target area and a second preselected target area, respectively;

a first holding means for holding a free end of said first cord at a preselected location within said first preselected target area circumscribed by said first remote target means;

a second holding means for holding a free end of said second cord at a preselected location within said second preselected target area circumscribed by said second remote target means;

whereby a golfer may practice chip shots by positioning a preselected ball within said first or second preselected target area and hitting said preselected ball toward said base member along a path of travel denoted by said first or second cord, respectively;

whereby a golfer may alternatively practice chip shots by positioning said preselected ball near said base member and hitting said preselected ball toward said first or second preselected target area along a path of travel denoted by said first or second cord, respectively.

6,015,353
GOLF SWING STROKE-ERROR-SIGNALLING SENSOR

Edward A Romano, 3563 Trevis Way, Carmel, Calif. 93923

Filed Sep. 2, 1998, Appl. No. 145,804
Int. Cl.[7] A63B *69/36*
U.S. Cl. 473—236 **1 Claim**

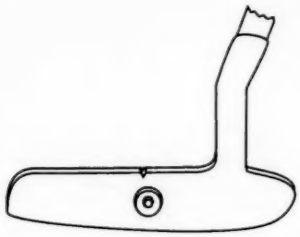
1. A ball-impact-error sensor/amplifier bonded to the ball hitting point of a golf club head for ball striker training, comprising,

the head of a golf club, upon the intended ball striking point of which is bonded,

the sensor's adhesive backed base in the form of a soft plastic disc ½ inch diameter×3/16 inch thick with a center hole that holds

a flat-ended, rigid probe ⅛ inch diameter×¼ inch long, seated upright on the club face

so that for the forward swinging club to strike the ball solidly, the club face, probe and ball must compress together squarely at impact.



failing which, the probe and wall of the probe base will spring-hinge aside under impact, thereby strongly amplifying impact errors into jarring and blatant mis-hits that must be curbed for ball striking mastery.

6,015,354

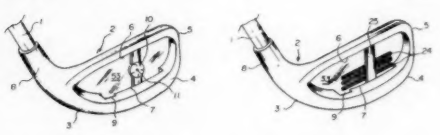
GOLF CLUB WITH ADJUSTABLE TOTAL WEIGHT, CENTER OF GRAVITY AND BALANCE

Stephen C. Ahn, 8809 S. Lea Ct., Fairfax, Va. 22031, and Suh Yong Lee, 4118 Amesbury La., Durham, N.C. 27757

Filed Mar. 5, 1998, Appl. No. 35,031

Int. Cl.[7] **A63B** *53/08*

U.S. Cl. 473—256 **3 Claims**



1. A golf club head having an adjustable center of gravity, said golf club head having a heel portion, a toe portion, a striking surface and a rear surface, said golf club head comprising:

a bottom portion extending rearwardly of said striking surface and having a slot formed therein and a top portion extending rearwardly of said striking surface and having a groove formed therein each of said slot and said groove extending generally horizontally between said heel and toe portions;

an elongated weight having a top end shaped for sliding engagement with said groove and a bottom end having a rearwardly extending portion for sliding engagement within said slot;

a disc shaped central portion formed in said weight and having a central bore formed therein, said central bore being threaded for threaded engagement with a set screw, said screw having a length extending into and through said bore and putting sufficient force on said rear surface to lock said weight into a desired horizontal position along said rear surface, whereby the location of the center of gravity may be selectively adjusted.

6,015,355

GOLF PUTTER

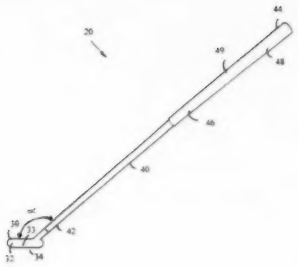
John M. Angel, 9 Hawthorne Place, St. John's, Newfoundland, Canada, A1B 4H3

Continuation of application No. 08/331,958, Oct. 31, 1994, abandoned. This application Jun. 21, 1996, Appl. No. 667,358.

Int. Cl.[7] **A63B** *53/02*

U.S. Cl. 473—314 **16 Claims**

1. A golf putter for accurately putting a golf ball toward a cup in a putting surface, where each putt with said golf putter is aligned by means of triangulation of the golf ball, said putting surface cup, and the eyes of a golfer, where the eyes of the golfer are laterally offset from the portion of the putting surface between the golf ball and the putting surface cup, and where the golf ball is to be propelled in a desired direction of initial travel when struck by said golf putter, said golf putter comprising:



an elongate shaft having lower and upper ends and a longitudinal axis oriented along its length;

striking means secured to said shaft means, said striking means being positionable with respect to said golf ball by manipulation of said shaft means, for subsequent striking of said golf ball;

means for properly gripping said elongate shaft such that the hands of said golfer are spaced apart by a distance of at least 30 cm one from the other on said elongate shaft when said golf putter is in use, to thereby permit said manipulation of said elongate shaft; and

means for positioning said golfer such that said golfer's eyes are spaced laterally away from said portion of the putting surface between the putting surface cup and the golf ball, thereby permitting said golfer to see the portion of said putting surface between the putting surface cup and the golf ball, thereby permitting said golfer to use triangulation of said golf ball, said cup in the putting surface, and the eyes of said golfer to obtain three-dimensional visual clues of the topography of the portion of the putting surface between said golf ball and said putting surface cup, thus allowing said golfer to accurately determine the desired direction of initial travel of said golf ball, so that said golf ball may be accurately putted toward said putting surface cup;

wherein said striking means comprises a substantially planar striking face of a golf putter head secured to said shaft in a manner so as to be parallel to a plane in which said longitudinal axis of said elongate shaft is disposed;

wherein said golf putter head has a bottom surface which defines a bottom plane which is perpendicular to both of said planes in which said longitudinal axis of said elongate shaft is disposed and said substantially planar striking face; and

wherein said means for positioning said golfer comprises there being an included angle of about 140° to 160° between said bottom plane of said golf putter head and said longitudinal axis of said elongate shaft and wherein said striking face is in a plane which is substantially perpendicular to said bottom plane.

6,015,356

GOLF BALL AND METHOD OF PRODUCING SAME

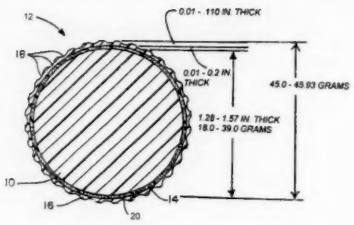
Michael J. Sullivan, Chicopee; John Nealon, Springfield; Mark Binette, Ludlow, and Dennis Nesbitt, Westfield, all of Mass., assignors to Lisco, Inc., Tampa, Fla.

Filed Jan. 13, 1997, Appl. No. 782,221

Int. Cl.[7] **A63B** *37/06;37/12*

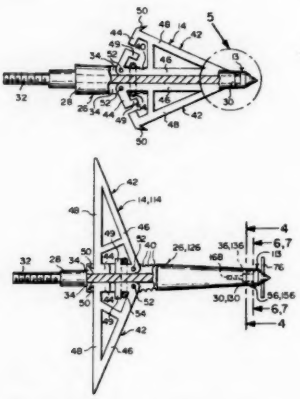
U.S. Cl. 473—373 **34 Claims**

24. A golf ball comprising a core, an inner ionomer resin cover layer and an outer cover layer, wherein said core has a diameter of less than 1.47 inches and a weight of less than 32.7 grams and said



inner cover layer has a thickness of greater than 0.050 inches and a weight of greater than 5.7 grams.

6,015,357
BROADHEAD FOR USE AS BOTH AN EXPANDABLE BLADE HEAD AND A FIXED BLADE HEAD
Joseph D. Rizza, 135 W. Franklin St., Bound Brook, N.J. 08805
Filed Dec. 2, 1998, Appl. No. 203,889
Int. Cl.[7] F42B *6/08*
U.S. Cl. 473—583 **27 Claims**



1. A broadhead for use as both an expandable blade head and a fixed blade head, said broadhead comprising:

a) a shaft;

b) a blade assembly having an expanded mode and a retracted mode, and being threadably mounted to said shaft; and

c) locking apparatus operatively connected to said blade assembly and selectively maintaining said blade assembly in said retracted mode, wherein said shaft comprises a shank that is elongated, slender and cylindrically-shaped, and has:

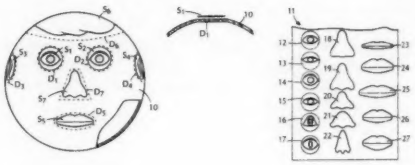
i) a proximal end for releasably engaging a string of a bow; and

ii) a distal end with a bore that is threaded and extends axially therein and threadably receives said blade assembly, wherein said blade assembly comprises a body that is elongated, slender, and substantially cylindrically-shaped, and has a proximal end that engages said distal end of said shank of said shaft and tapers axially forwardly therefrom to a distal end, wherein said body of said blade assembly further has three slots that are equally spaced-apart, radially-oriented and extend axially from said proximal end of said body of said blade assembly, to, and opens into, said distal end of said body of said blade assembly, wherein said distal end of said body of said blade assembly has:

A) a bore that extends axially therein; and

B) a tab that extends axially forwardly therefrom, offset from said bore in said distal end of said body of said blade assembly, between a pair of slots of said three slots in said body of said blade assembly.

6,015,358
BALL HAVING STICKER APPLIED THERETO
Donald Spector, 380 Mountain Rd., Union City, N.J. 07080
Filed Oct. 1, 1998, Appl. No. 164,995
Int. Cl.[7] A63B *39/00*
U.S. Cl. 473—595 **10 Claims**

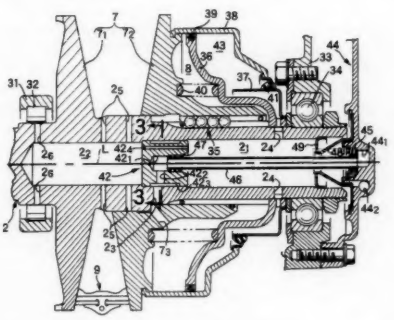


1. A play ball having the appearance of a humanoid head comprising:

A. a ball molded of elastomeric material having a contoured surface on which is formed flat depressions that merge with this surface, said flat depressions being placed at sites corresponding to facial features of the humanoid head; and

B. stickers adhesively applied to the respective depressions having printed thereon facial features appropriate to the sites.

6,015,359
BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION
Rikiya Kunii, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 16, 1998, Appl. No. 39,267
Claims priority, application Japan, Mar. 17, 1919, 9-062768
Int. Cl.[7] F16H *59/00*
U.S. Cl. 474—18 **6 Claims**



3. A continuously variable transmission comprising:

an input shaft;

an output shaft, wherein said output shaft has first and second in-shaft oil chambers;

a drive pulley mounted on said input shaft, the drive pulley having a stationary pulley half and a movable pulley half, wherein said drive pulley has a variable groove width;

a drive pulley mounted on said output shaft, the driven pulley having a stationary pulley half and a movable pulley half, wherein said driven pulley has a variable groove width;

an endless belt reeved around said drive pulley and said driven pulley;

pulley oil chambers to activate said movable pulley halves;

canceler oil chambers formed adjacent to said pulley oil chambers;

a first oil path and a second oil path formed inside said output shaft, the first oil path supplying oil to said pulley oil chamber of said driven pulley supported on said output shaft, and the second oil path supplying oil to said canceler oil chamber of said driven pulley;

a throttle extending between the first and second in-shaft oil chambers; and

at least one oil path open end extending from said second in-shaft oil chamber to a space between said stationary pulley half and said movable pulley half, wherein the second oil path communicates with the at least one oil path open end to lubricate said endless belt, in a space between said stationary pulley half and said movable pulley half, with the oil that is discharged from said canceler oil chamber of said driven pulley through said at least one oil path open end by a reduction in volume of said canceler oil chamber of said driven pulley.

6,015,360

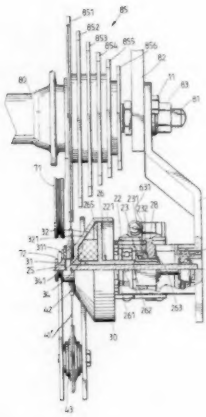
AUTOMATIC GEARSHIFTING DEVICE OF MULTI-STAGE FLY WHEEL OF BICYCLE

David Chang, Taichung Hsien, Taiwan, assignor to Falcon Industrial Co., Ltd., Taichung Hsien, Taiwan

Filed Jun. 17, 1998, Appl. No. 98,377

Int. Cl.[7] **F16H** *9/00*

U.S. Cl. 474—80 **13 Claims**



1. An automatic gearshifting device of a bicycle multi-stage fly wheel, said device comprising:

a main body provided with a rotary shaft fastened pivotally therewith;

a fastening arm fastened with said main body and a bicycle frame;

a rotary member fastened with said rotary shaft and provided with a receiving cell;

an urging member fastened with said rotary shaft such that said urging member is capable of sliding in the direction of a longitudinal axis of said rotary shaft, and that one end of said urging member is located in said receiving cell;

a plurality of weights located in said receiving cell such that said weights are in contact with said rotary member;

a drive chain guiding mechanism for shifting a drive chain from one tooth to another tooth of a fly wheel gear cluster;

a connection member connecting said urging member with said drive chain guiding mechanism; and

a transmission mechanism connecting said rotary shaft with said fly wheel gear cluster;

said urging member capable of being actuated by a centrifugal force of said weights in motion to displace in the direction of the longitudinal axis of said rotary shaft so as to enable said drive chain guiding mechanism to shift said drive chain from one tooth to another tooth of the fly wheel gear cluster;

wherein said receiving cell is provided with an inclined plane; and wherein said weights are driven by said rotary shaft to slide along said inclined plane.

6,015,361

DIFFERENTIAL APPARATUS WITH TWO WHEEL/FOUR WHEEL DRIVE SWITCHING MECHANISM

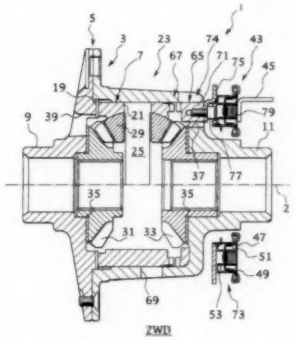
Nobushi Yamazaki; Masao Teraoka, and Takeharu Saeki, all of Tochigi, Japan, assignors to Tochigi Fuji Sangyo Kabushiki Kaisha, Tochigi-ken, Japan

Filed Aug. 29, 1997, Appl. No. 920,856

Claims priority, application Japan, Aug. 30, 1996, P8-230576

Int. Cl.[7] **B60K** *23/08;* **F16H** *48/06*

U.S. Cl. 475—230 **8 Claims**



1. A differential apparatus in combination with a partial four-wheel drive vehicle having an engine and a two-wheel/four-wheel driving switching mechanism arranged on the side of the two axles to which engine driving force is not transmitted under the vehicle's two-wheel driving condition, said differential apparatus comprising:

a differential casing having an input gear fixed thereto, said differential casing being rotated by the engine through the intermediary of said input gear;

a pair of output side gears disposed in said differential casing, opposing each other and rotating coaxially with an axis of said differential casing;

a differential mechanism distributing driving force of said engine, which has been inputted from said differential casing, into both of said axles of said vehicle through said output side gears;

a clutch for operatively connecting said differential casing with said axles of said vehicle so that driving torque applied on said differential casing is transmitted to said axles;

an actuator for releasing said clutch from connecting operation thereof in a manner that the driving torque applied on said differential casing is not transmitted to said axles;

an urging member for causing said clutch to connect said differential casing with said axles on condition that said actuator is inactivated, whereby said driving torque applied on said differential casing can be transmitted to said axles;

wherein said clutch, actuator and urging member constitutes said two-wheel/four-wheel drive switching mechanism, said two-wheel/four-wheel drive switching mechanism arranged nearby the differential casing; and

said urging member comprises an annular urging member disposed coaxially with the rotational axis of said differential casing, said actuator comprising an annular actuator disposed coaxially with the rotational axis of said differential casing,

said actuator comprising and fluid pressure actuator disposed between a side wall of said differential casing and a bearing for carrying said differential casings, said fluid pressure actuator having an operating chamber filled with fluid, whereby the associated operation of said clutch can be released since said clutch is shifted in a direction of the rotational axis of said differential casing by changing a volume of said fluid accommodated in said operating chamber.

6,015,362

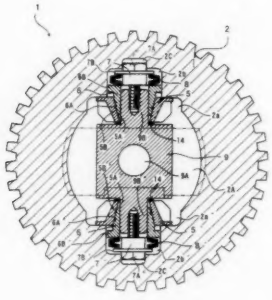
DIFFERENTIAL GEAR ASSEMBLY WITH DISC-SHAPED INPUT MEMBER

Koji Irikura, Kobe, and Hirohiko Kawada, Amagasaki, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Hyogo-ken, Japan

Filed May 6, 1997, Appl. No. 841,831

Int. Cl.[7] F16H *48/22*

U.S. Cl. 475—231 **11 Claims**



1. A differential gear assembly comprising:

a disc-shaped input member having a central portion, an outer portion around the central portion, and one or more open space portions formed between the central portion and the outer portion, the input member being provided with an input gear receiving a drive force at the edge of the outer portion;

a pair of output shafts extending opposite each other along the axis of the input member and one end of each of the output shafts being loosely fitted and supported in a central bore formed in the central portion of the input member;

a pair of side bevel gears each of which is fixedly attached near the end of each output shaft closer to the input member;

one or more support shafts extending radially from the central portion into the open space portions of the input member;

one or more bevel pinions rotatably supported on the one or more support shafts, respectively, to mesh with the pair of side bevel gears; and

a friction mechanism located in at least one of said one or more open space portions that permits the bevel pinion to rotate with rotational resistance, said friction mechanism including

(a) an end piece fixed on said one or more support shafts,

(b) at least one friction member mounted on the support shaft between the bevel pinion and the end piece in an axially slidable manner, the friction member contacting a side wall of the open space portion formed on said outer portion of said input member so that the friction member cannot rotate relative to the support shaft, and

(c) a biasing member disposed between the at least one friction member and the end piece to push the at least one friction member against the bevel pinion.

6,015,363

AUTOMATIC TRANSMISSION REQUIRING OPERATION OF SINGLE FRICTION DEVICE FOR GEAR SHIFT

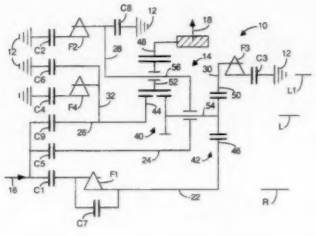
Roland Mathis, Ribeauville, France, assignor to Delphi France Automotive Systems, La Garenne-Colombes, France

Filed Nov. 16, 1998, Appl. No. 192,630

Claims priority, application United Kingdom, Apr. 24, 1998, 9808672

Int. Cl.[7] P16H *3/62*

U.S. Cl. 475—281 **5 Claims**



1. An automatic transmission comprising a housing; a planetary gear train mounted within the housing; an input drive shaft for providing input drive to the planetary gear train; an output drive shaft connected with an output drive from the planetary gear train; a first clutch connected between the input drive shaft and a first drive input to the planetary gear train; a second clutch connected between a first reaction input to the planetary gear train and the housing; a third clutch connected between a second reaction input to the planetary gear train and the housing; a fourth clutch connected between a third reaction input to the planetary gear train and the housing; and a fifth clutch connected between a second drive input to the planetary gear train and the input drive shaft; wherein for first forward gear ratio the first and second clutches are engaged; for second forward gear ratio the first, second and third clutches are engaged; for third forward gear ratio the first, second, third and fourth clutches are engaged; and for fourth forward gear ratio the first, second, third, fourth and fifth clutches are engaged.

6,015,364

CONTROL SYSTEM INCLUDING WHEEL SKID PREVENTING MEANS BY INCREASING THE CONTROL TIME FOR ENGINE AND TRANSMISSION FUNCTIONS

Adriana Le Van, Levallois-Perret, France, assignor to Magneti Marelli France, Nanterre, France

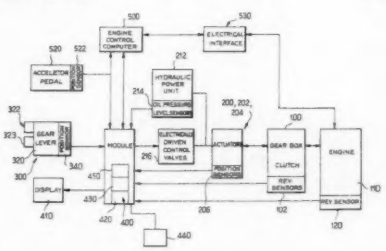
PCT No. PCT/FR96/00504, § 371 Date Oct. 2, 1997, § 102(e) Date Oct. 2, 1997, PCT Pub. No. WO96/31360, PCT Pub. Date Oct. 10, 1996

PCT Filed Apr. 3, 1996, Appl. No. 930,655

Claims priority, application France, Apr. 3, 1995, 95 03887

Int. Cl.[7] B60K *41/28*

U.S. Cl. 477—97 **6 Claims**



1. A semi-automatic gearbox system, including means for detecting a low-grip mode in which vehicle wheels are gripping poorly and means responding to a low-grip mode detection by increasing the time required for;

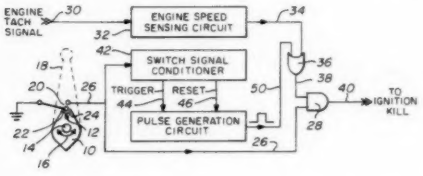
reducing the engine torque prior to gear changes;
declutching prior to gear changes;
clutching after gear changes;
re-establishing the engine torque after gear changes; and
clutching while the vehicle is starting,
so as to minimize variations in the engine torque transmitted to the wheels.

6,015,365

ELECTRONIC GEAR SHIFT ASSIST CIRCUITRY

Richard P. Kolb, Prairie View, and Robert P. Otka, Gurnee, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 28, 1999, Appl. No. 239,452
Int. Cl.[7] B60K *41/08*
U.S. Cl. 477—103 **14 Claims**



1. A shift-assist circuit for reducing the torque to the clutch of a transmission during the shift process comprising:

an interrupt switch responsive to movement of a transmission shift lever for providing an interrupt signal;

an engine speed sensing circuit for providing a speed threshold signal for indicating when the engine speed is above or below a selected speed;

a pulse-generation circuit for providing a pulse signal having a fixed time period in response to receiving said interrupt signal; and

a combining circuit for generating an ignition-kill signal upon receiving said interrupt signal and an arm signal representative of one of either said speed threshold signal and said pulse signal.

6,015,366

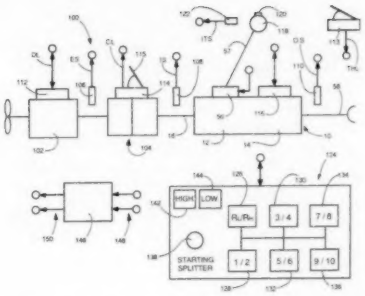
VEHICULAR SEMI-AUTOMATIC SHIFT IMPLEMENTATION SYSTEM FOR LEVER-SHIFTED, SPLITTER-TYPE, COMPOUND TRANSMISSION WITH AN INTENT-TO-SHIFT SWITCH OPERABLE TO CAUSE AUTOMATIC CONTROL OF ENGINE FUELING AND INITIATION OF A SPLITTER SHIFT

Ronald K. Markyvech, Allen Park; Thomas A. Genise, Dearborn, and James R. McReynolds, Richland, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of application No. 08/649,833, Apr. 30, 1996, abandoned. This application Aug. 25, 1997, Appl. No. 917,301.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B60K *41/08*; **F16H** *59/70*
U.S. Cl. 477—109 **10 Claims**

1. A vehicular semi-automated shift implementation system comprising:

a manually shifted, compound transmission having a main section and a splitter section, said transmission having an input shaft driven by a fuel-controlled engine, an output shaft and a plurality of selectably engageable and disengageable jaw clutches allowing selection of a plurality of drive ratios and neutral, said jaw clutches selectively positioned by a manually operated shift lever having a plurality of selectable shift lever positions defining a shift pattern;



a manually operated intent-to-shift switch by which an operator can signal, independent of moving said shift lever, an intention to manually shift the transmission;

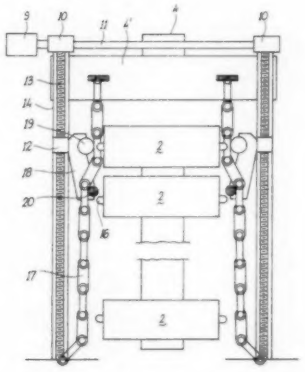
means to sense operation of said intent-to-shift switch and effective, upon sensing operation of said intent-to-shift switch, (1) to automatically cause said engine to be fueled to minimize torque transfer between said input shaft and said output shaft, and (2) to automatically initiate a splitter shift.

6,015,367

DEVICE FOR AUTOMATICALLY SELECTING AND HOOKING WEIGHTS OF PHYSICAL EXERCISING APPARATUSES

Mauro Scaramucci, Ascoli Piceno, Italy, assignor to Newform S.p.A., Ascoli Piceno, Italy

Filed Dec. 22, 1997, Appl. No. 996,235
Claims priority, application Italy, Dec. 20, 1996, RM96A0888
Int. Cl.[7] A63B *21/06*
U.S. Cl. 482—5 **13 Claims**



1. A device for automatically selecting and engaging weights of a physical exercising apparatus, comprising:

a fixed frame;

a plurality of weights to be selected and engaged;

a dragging element for supporting selected and engaged weights to be shifted in position with respect to said fixed frame;

means for selecting and engaging weights to be supported by said dragging element, said means for selecting and engaging weights to be supported by said dragging element including a motion system, said motion system including a motor, at least one reduction gear, a worm screw coupled with said at least one reduction gear, and a selecting and engaging device which is supported on and movable with said worm screw, and said motion system being supported by and movable with said dragging element;

activation means for activating said motion system supported by said dragging element; and

electronic control and setting means for setting and controlling said means for selecting and engaging weights so as to have said motion system position said selecting and engaging element into an engagement relationship with respect to a preselected one of the weights to be supported following activation of said activation means;

said selecting and engaging device including an interaction element which is carried along said worm screw and provided with a coupling roll, which is positioned for interacting with links of a chain supported by said dragging element, so as to couple a chain link with a weight engagement member provided on a selected one of said weights.

6,015,368

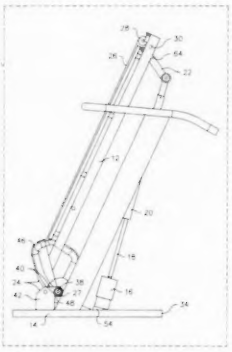
FOLDING TREADMILL AND A METHOD OF FOLDING A TREADMILL

William E. Clem; Cory R. Williamson, and Martin Albini, all of Bozeman, Mont., assignors to Conetex, Inc., Elverson, Pa.

Filed Nov. 12, 1998, Appl. No. 190,988

Int. Cl.[7] A63B *22/02*

U.S. Cl. 482—54 **30 Claims**



1. A folding treadmill, comprising:

a treadmill frame having a right edge, a left edge, a front edge, and a rear edge;

a carriage which is pivotally connected to the front edge of said treadmill frame;

a lift motor rotatably mounted to said carriage;

a lift screw having two ends, said lift screw being turnably connected to said lift motor and extending outwardly therefrom;

a lift arm connected to said lift screw on the end of said lift screw opposite said lift motor, whereby extension of said lift arm is driven by turning of said lift screw; and

a swinging arm having two ends and a midpoint, said swinging arm being connected at the ends to the right and left edges of said treadmill frame by a pair of pivotal connectors, and being connected at the midpoint to said lift arm.

6,015,369

FITNESS SLED EXERCISE MACHINE

Aaron P. Rasmussen, 1776 Essex St., El Cajon, Calif. 92020

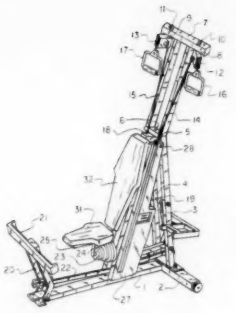
Continuation-in-part of application No. 09/005,468, Jan. 12, 1998, abandoned. This application Jun. 1, 1999, Appl. No. 323,283.

Int. Cl.[7] A63B *21/068*

U.S. Cl. 482—96 **20 Claims**

1. A fitness sled exercise machine comprising:

a frame;



an inclined rail attached to the frame;

a body support sled slidably engaging the inclined track and including a seat for supporting a user and a means for supporting weights;

a trifurcated power lever pivotally attached to the frame, an extension of the power lever being operatively connected to the sled to lift the sled in response to movement of the power lever;

a hydraulic cylinder operatively connected to an extension of the power lever to oppose movement of the power lever;

a pulley and line lift apparatus operatively connected to an extension of the power lever for manipulation by a seated user's arms to move the power lever and lift the sled along the inclined rail; and

a leg lever pivotally connected to the frame and operatively connected to an extension of the power lever for manipulation by a seated user to move the power lever and lift the sled along the inclined rail.

6,015,370

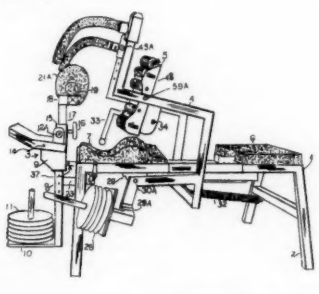
COMBINED THERAPEUTIC EXERCISE APPARATUS FOR THE BACK

Raffaele Martini Pandozy, 2312 Grand Ave., Dallas, Tex. 75215

Filed May 29, 1997, Appl. No. 854,178

Int. Cl.[7] A63B *21/06*

U.S. Cl. 482—97 **19 Claims**



1. A therapeutic exercise apparatus for the back, comprising:

a bench for supporting the user in a reclined position;

a leg swinging mechanism comprising a swinging member having an intermediate portion pivotally attached a forward end of the bench for rotation about a first horizontal axis, a lower portion having means for holding a weight resistance such that swinging movement of the swinging member is resisted, and an upper portion having a leg rest for engaging a user's legs behind the knees and a foot rest for receiving their feet;

a pivoting lever having an intermediate portion pivotally attached to a side of the bench for rotation about a second horizontal axis transverse to the first, a forward portion having a second means for holding a weight resistance such that

forward and rearward movement of the pivoting lever are selectively resisted, and a rearward portion having handle bars and a pivoting support for receiving the user's back.

6,015,371

EXERCISE MECHANISM

Christopher Davitt, 155 Old Orchard Rd., Buxton, Me. 04072

Filed Dec. 24, 1998, Appl. No. 220,840
Int. Cl.[7] A63B *21/02*
U.S. Cl. 482—129 **13 Claims**

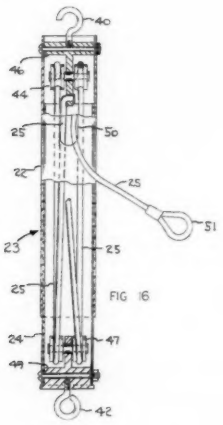


FIG 16

1. An exercise mechanism comprising:
first and second anchorages;
an elastic resistance means extending from said first anchorage;
a variable length connector means extending between said second anchorage and said elastic resistance means; and
said variable length connector means comprising an elongated housing, a flexible tension element extending from said housing at a point near said second anchorage, and a handgrip carried by the external end of said tension element, whereby a manual pulling force on said handgrip reduces the length of said housing while applying an operating force to said elastic resistance means.

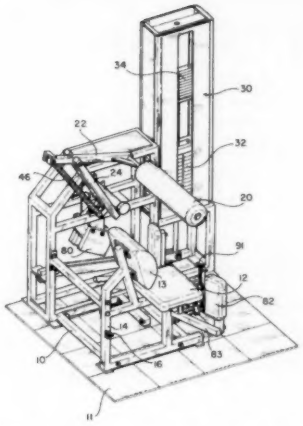
6,015,372

ABDOMINAL EXERCISE MACHINE AND METHODS

Clay J Steffee, Anthony; Larry D Berry, Orange Springs, and Russell W Kershaw, Silver Springs, all of Fla., assignors to MedX 96, Inc., Ocala, Fla.

Filed Mar. 3, 1998, Appl. No. 33,603
Int. Cl.[7] A63B *23/02*
U.S. Cl. 482—137 **24 Claims**

1. A machine for exercising abdominal muscles of the human body comprising in combination, a movement arm moveable about an axis upon engagement with the body, a resistance connectable to the movement arm to oppose movement of the movement arm about said axis in one direction, and drive transmission means between said resistance and said movement arm for transmitting movement therebetween, and wherein said movement arm includes two members pivotally interconnected, and spring means biasing one of the members to a raised position relative to the other member to allow entry and exit of a user into and from the machine, said one member being located to be engageable by the upper front of the torso of the user for movement in a vertical plane between a start position and a finish position advanced forwardly of the user and downwardly, the other member being



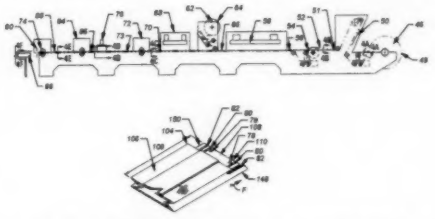
moveable between said start and finish positions about a generally horizontal axis.

6,015,373

METHOD FOR WICKET-TOP CONVERTING OF A CROSS-LAMINATED SYNTHETIC RESIN FIBER MESH BAG

Corbett D. Henderson, McAllen, Tex., and Jerry R. Winiecki, DePere, Wis., assignors to Kenneth Fox Supply Co., McAllen, Tex.

Filed Aug. 4, 1998, Appl. No. 129,459
Int. Cl.[7] B65D *65/16*
U.S. Cl. 493—196 **3 Claims**



1. A method of forming wicket-top, open mesh bags from a sheet of cross-laminated synthetic resin fabric comprising the steps of:
advancing a longitudinally moving sheet of the cross-laminated synthetic resin fabric material, said material being formed of synthetic resin fiber open mesh having an upper and a lower surface of warp and weft fibers and having a top side and a bottom side and longitudinal side edges;
folding the longitudinal side edge portions of said sheet of synthetic resin fiber open mesh toward each other into an overlapping center position above a lower central portion to form a folded tubular web of the cross-laminated synthetic resin fiber open mesh, such that the surface of one side edge of the fabric is in overlapping relationship with the upper surface of the opposite side edge of the fabric and having intersecting mesh fibers of the overlapping side edges in overlapping, overlying relationship with one another;
sealing the intersecting mesh fibers in the folded overlapping side edge portions of the fabric together over the overlapping center position above the lower central portion in a longitudinal direction to form a tubular web having elongated side edges, and further;
forming a plurality of web slots in said tubular web at selected positions along its length;

forming laterally spaced wicket holes in said tubular web adjacent said web slots;

laterally slitting an upper portion of said tubular web to form a wicket thereon;

cutting said web transversely across its width at selected positions to form a finished tubular wicket-top sleeve; and

closing said tubular sleeve at a lower end opposite said wicket to form the open-mesh wicket-top synthetic resin fabric bag.

6,015,374

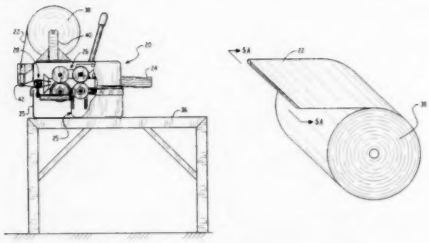
COMPACT CUSHIONING CONVERSION MACHINE AND METHOD USING PRE-FOLDED PAPER

Cynthia S. Murphy, Chardon, and Richard O. Ratzel, Westlake, both of Ohio, assignors to Ranpak Corp., Painesville, Ohio

Provisional application No. 60/005,489, Oct. 16, 1995. This application Jan. 11, 1996, Appl. No. 584,092.

Int. Cl.[7] B31D *5/04*

U.S. Cl. 493—464 **34 Claims**



1. A method of making a three-dimensional cushioning product, comprising the steps of:

providing an essentially two-dimensional web of flat folded sheet-like stock material of one or more plies, the flat folded stock material having a plurality of layers at least two of which are joined at a longitudinally extending fold;

separating adjacent layers of the flat folded stock material from one another to from an expanded strip of stock material; and

crumpling the expanded stock material to form the three-dimensional cushioning product.

6,015,375

CENTRIFUGE WITH A CENTRIFUGAL DRUM SUBDIVIDED INTO A PEELING CHAMBER AND A HYDROHERMETIC CHAMBER

Reinhard Moss, Ennigerloh, Germany, assignor to Westfalia Separator AG, Oelde, Germany

PCT No. PCT/DE97/01490, § 371 Date Jul. 17, 1998, § 102(e) Date Jul. 17, 1998, PCT Pub. No. WO98/05431, PCT Pub. Date Feb. 12, 1998

PCT Filed Jul. 15, 1997, Appl. No. 101,608

Claims priority, application Germany, Aug. 2, 1996, 196 31 226

Int. Cl.[7] B04B *11/00*

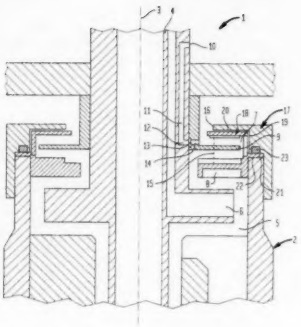
U.S. Cl. 494—27 **5 Claims**

1. A centrifuge, comprising:

a centrifugal drum rotating about a vertical rotational axis and having a peeling chamber;

a peeling device disposed in the peeling chamber for continuously draining a liquid phase clarified or separated in the centrifugal drum;

a locking disk located above the peeling chamber and securely fixed to the peeling device, with the locking disk projecting in a locking chamber circulating conjointly with the centrifugal drum and forming an outer bottom, wherein the peeling device is provided with a channel for supply of a sealing liquid into the locking chamber;



a first lid bounding the locking chamber upwardly and outwardly and having a free edge facing the rotational axis and forming an overflow weir; and

a second locking chamber lid arranged between the locking disk and the first lid, said second locking chamber lid being inwardly offset with respect to the outer bottom of the locking chamber and forming with the first lid a flow channel for carrying away solids deposited on the outer bottom of the locking chamber via the overflow weir.

6,015,376

DNA SEQUENCE CORRESPONDING TO THE MINIMAL ESSENTIAL PROMOTER OF THE HUMAN SODIUM-IODIDE SYMPORTER (HNIS)

Kenneth Bruce Ain, and Gopalakrishnan Venkataraman, both of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Jan. 13, 1998, Appl. No. 6,186

Int. Cl.[7] C07H *21/02;21/04;* **C12Q** *1/68*

U.S. Cl. 586—23.1 **10 Claims**

1. A DNA molecule consisting of at least about 15 contiguous nucleotides of SEQ ID NO:1 residues 647–1343 or at most about 696 contiguous nucleotides of SEQ ID NO: 1residues 647–1343.

6,015,377

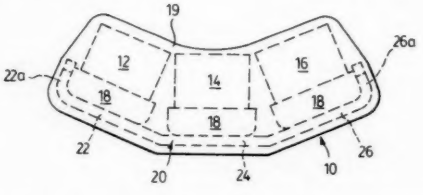
MAGNETIC PENETRATOR

L. Edward Brown, Cambridge, and Adam R. Resch, Kitchener, both of Canada, assignors to 1184949 Ontario Inc., Cambridge, Canada

Filed May 29, 1998, Appl. No. 86,607

Int. Cl.[7] A61N *2/00*

U.S. Cl. 600—9 **20 Claims**



1. A device for creating a penetrating magnetic field, comprising a plurality of magnets mounted in spaced relation and having south poles oriented toward a substantially rigid magnetic backing plate and north poles oriented in a forward direction to direct negative magnetic energy forwardly from the backing plate, whereby the magnets are retained in a predetermined angular relation relative to each other.

6,015,378
METHOD AND APPARATUS FOR TEMPORARILY IMMOBILIZING A LOCAL AREA TISSUE

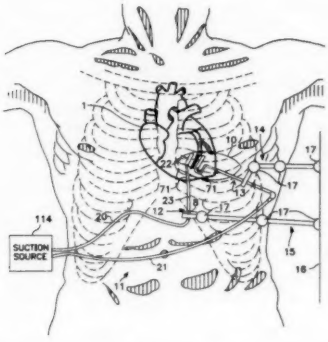
Cornelius Borst; Hendricus J. Mansvelt Beck, both of Bilthoven; Paul F. Grundeman, Amsterdam, and Erik W. L. Jansen, Zeist, all of Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of application No. 08/531,363, Sep. 20, 1995, Pat. No. 5,836,311. This application Oct. 3, 1996, Appl. No. 725,371.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61F** *2/00*

U.S. Cl. 600—37 **3 Claims**



1. A method of immobilizing an area of tissue comprising:

contacting at least one primary suction port on a first paddle to a first surface of tissue;

contacting at least one secondary suction port on a second paddle to a second surface of tissue;

creating a suction in at least one primary suction port to cause the first paddle to grasp the first surface of the tissue;

creating a suction in at least one secondary suction port to cause the second paddle to grasp the second surface of the tissue;

moving the first paddle away from the second paddle; and

fixing at least one of the first and second paddles to a stationary object.

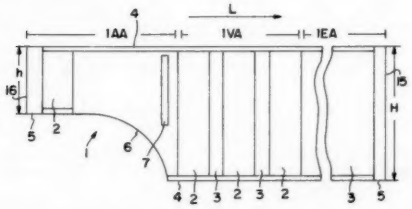
6,015,379
ERECTION AID

Hans E. Sachse, Lerhenstr. 55, 90425 Nuremberg, Germany

Filed Jun. 27, 1997, Appl. No. 884,586

Int. Cl.[7] **A61N** *5/00*

U.S. Cl. 600—39 **24 Claims**



1. An erection aid for stiffening the male member, which is adapted to be wrapped around the body of the penis and to largely cover it, wherein the erection aid comprises

an elastic stiffening band, said stiffening band comprising, in a longitudinal direction,

a) an initial edge,

b) an initial portion (IAA) adjoining the initial edge,

c) a stiffening portion (IVA) adjoining the initial portion,

d) a terminal portion (IEA) adjoining the stiffening portion, and

e) a terminal edge adjoining the terminal portion, and having

i) an upper edge adapted to come to rest in the sulcus (**10**) of the penis below the edge of the glans,

ii) a lower edge adapted to come to rest near the root of the penis (**14**),

and further having two faces adapted to form an outer face and an inner face,

which stiffening band is stretchable in the longitudinal direction and wherein at least one of the faces of the elastic stiffening band is self-adhesive, the self-adhesive face being adapted to adhere to the skin of the penis and to the other face of the stiffening band solely by static friction, which stiffening band further comprises rigid reinforcements positioned in the stiffening portion, said rigid reinforcements extending between the upper edge and the lower edge of the stiffening band and being spaced apart from one another by elastic segments of the stiffening portion.

6,015,380
EXTRA-CAVERNOSAL PENILE IMPLANTS

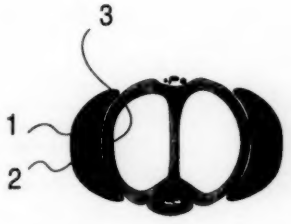
Louis Subrini, 5 Rue Emmanuel Chabrier, 78370 Plaisir, France

Continuation of application No. 08/579,825, Dec. 28, 1995, abandoned. This application Feb. 5, 1998, Appl. No. 42,281.

Claims priority, application France, Dec. 28, 1994, 94-15763

Int. Cl.[7] **A61F** *5/00*

U.S. Cl. 600—40 **10 Claims**



1. Penile implant for implantation outside the corpus cavernosum for increasing the total volume of the penis by a concurrent increase of both the length and the diameter, said implant comprising two cheeks independent from one another, said cheeks being adapted to cover the outer lateral sides of the corpus cavernosum without covering the upper and lower sides and each of said cheeks having a crescent-shaped or hemicylindrical vertical cross-section whereby each cheek includes a substantially concave to substantially flat inner surface adapted to cover the outer lateral side of the corpus cavernosum and a substantially convex outer surface, each of said cheeks including a proximal end and a distal end adapted to conform to the anatomy of the sulcus of the glans, said distal end comprising an oblique planar end surface which slants toward the proximal end in a direction from the outer surface to the inner surface.

6,015,381
ENDOSCOPIC TREATMENT TOOL

Teruo Ouchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kaisha, Tokyo, Japan

Filed Jan. 13, 1998, Appl. No. 6,166

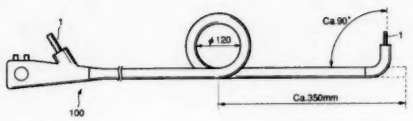
Claims priority, application Japan, Jan. 17, 1997, 9-006144

Int. Cl.[7] **A61B** *1/00*

U.S. Cl. 600—104 **16 Claims**

1. An endoscopic treatment tool comprising:

a flexible sheath adapted to pass through a forceps channel of an endoscope;



an operation wire passing through said sheath, said operation wire being axially movable back and forth relative to said sheath;

a driven part disposed at a distal end of said sheath, and connected to a distal end of said operation wire; and

an operation part disposed at a proximal end of said sheath,

wherein said sheath has a rotation follow-up capability that extends through the entire length of the sheath; and

wherein both of said sheath and said operation wire are non-rotatively connected to said operation part so that rotation of the operation part causes rotation of the driven part about an axis of the operation wire.

6,015,382

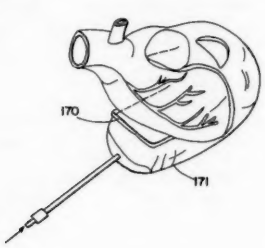
INFLATABLE MANIPULATOR FOR ORGAN POSITIONING DURING SURGERY AND METHOD OF USE

Hans J. Zwart; Lawrence R. Tyler, both of Kettering, Ohio; Thomas J. Palermo, San Jose, Calif.; Kevin Van Bladel, San Mateo, Calif.; Roderick A. Young, Palo Alto, Calif., and James E. Jervis, Atherton, Calif., assignors to General Surgical Innovations, Inc., Cupertino, Calif.

Filed Oct. 16, 1997, Appl. No. 951,799

Int. Cl.[7] A61B *17/00*

U.S. Cl. 600—207 **62 Claims**



1. A manipulator for displacing an organ from an adjacent anatomic structure and thereafter orienting, manipulating, retracting or stabilizing said organ during a surgical procedure, said manipulator comprising:

an inflatable balloon, wherein said balloon is formed from a plurality of flexible sheets enclosing a chamber, a first flexible sheet having a first thickness and a second flexible sheet having a second thickness, the first thickness being less than the second thickness, said balloon having an inner surface and an outer surface;

an infusion source which is in fluid communication with a proximal end of said chamber of said balloon; and

a positioning structure coupled to said balloon.

6,015,383

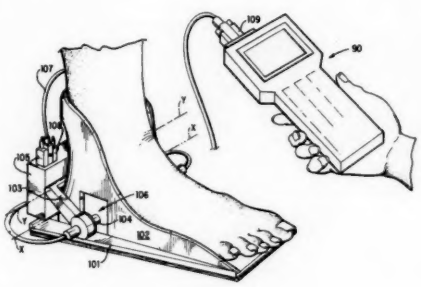
APPARATUS AND METHOD FOR ACOUSTIC ANALYSIS OF BONE

Joe P. Buhler, Portland; David Butt, Beaverton; Jeffrey H. Goll, Lake Oswego; Neldon C. Wagner, Aloha, and Hartwell H. Whitney, Portland, all of Oreg., assignors to Metra Biosystems, Inc., Mountain View, Calif.

Division of application No. 08/615,643, Mar. 13, 1996, Pat. No. 5,720,290, which is a continuation-in-part of application No. 08/404,813, Mar. 13, 1995, Pat. No. 5,592,943, which is a continuation-in-part of application No. 08/043,870, Apr. 7, 1993, Pat. No. 5,396,891. This application Oct. 1, 1997, Appl. No. 942,233.

Int. Cl.[7] A61B *8/00*

U.S. Cl. 600—437 **14 Claims**



1. A system for externally providing a measurement in a vertebrate subject of the characteristic behavior of an acoustic wave in a bone disposed within a foot having a longitudinal axis, the system comprising:

a. a base having a surface for receiving the sole of the foot;

b. first and second transducers mountable in spaced relationship with respect to the bone;

c. signal excitation means for causing the first transducer to produce an acoustic waveform that is propagated into the subject and received by the second transducer along a path that includes the bone;

d. characteristic determination means for determining a characteristic of the behavior of the waveform along the path;

e. a display for displaying outputs of the characteristic determination means;

f. a first assembly containing the base and the transducers; and

g. a second assembly, containing the display, that is hand-holdable and permits the measurement to be taken while holding the second assembly in one hand of the user,

wherein the signal excitation means and the characteristic determination means are collectively contained within the first and second assemblies.

6,015,384

ULTRASONIC SYSTEM AND METHOD FOR TISSUE VIABILITY IMAGING

Bhaskar S. Ramamurthy, San Jose, and Joan C. Main, Mountain View, both of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed Aug. 31, 1998, Appl. No. 144,843

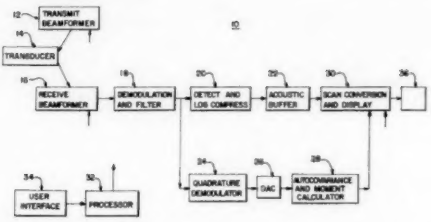
Int. Cl.[7] A61B *8/00;8/06*

U.S. Cl. 600—440 **42 Claims**

1. A method of imaging to aid tissue viability determinations comprising the steps of:

(a) detecting tissue motion corresponding to at least one point of in a tissue;

(b) estimating perfusion as a function of intensity data and time for the at least one point; and



(c) displaying an image responsive to the detected tissue motion and the estimated perfusion.

6,015,385

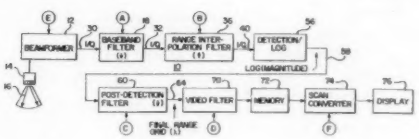
ULTRASONIC DIAGNOSTIC IMAGING SYSTEM WITH PROGRAMMABLE ACOUSTIC SIGNAL PROCESSOR

David J. Finger, San Jose; Jonathan Bernard, Santa Clara, and Albert Gee, Los Altos, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Division of application No. 08/760,083, Dec. 4, 1996, Pat. No. 5,919,137. This application Mar. 25, 1998, Appl. No. 47,967.

Int. Cl.[7] A61B *8/00*

U.S. Cl. 600—443 **11 Claims**



1. A method for controlling signal frequency response in an ultrasonic diagnostic imaging system of the type comprising a beamformer stage, operative to generate a series of acoustic signals at a first sample rate, a detector stage responsive to the acoustic signals to generate detected signals characterized by a first bandwidth, and a scan converter responsive to the detected signals, said method comprising the following steps:

(a) selectively increasing the first sample rate to a second sampling rate of the acoustic signals prior to detection of the acoustic signal in the detection stage to reduce aliasing artifacts introduced by the detection stage; and

(b) selectively reducing the first bandwidth to a second bandwidth of the detected signals prior to scan conversion.

6,015,386

SYSTEM INCLUDING AN IMPLANTABLE DEVICE AND METHODS OF USE FOR DETERMINING BLOOD PRESSURE AND OTHER BLOOD PARAMETERS OF A LIVING BEING

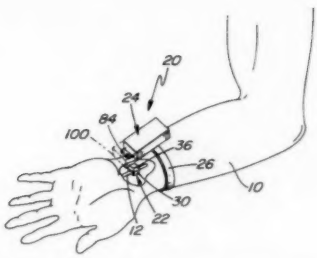
Kenneth Kensey, Chester Springs, and Harold Clupper, West Chester, both of Pa., assignors to BPM Devices, Inc., Exton, Pa.

Filed May 7, 1998, Appl. No. 73,728

Int. Cl.[7] A61N *5/00*

U.S. Cl. 600—486 **27 Claims**

1. A blood pressure monitoring system, said system arranged to be used in a living being, the being having a blood vessel in which blood flows and which exhibits a pressure, said system being arranged for monitoring the blood pressure within the blood vessel of the living being and comprising a passive sensor unit and an associated energy application unit, said sensor unit being adapted to be implanted within the body of the being, said energy application unit being adapted to be located externally of the body of the being for wireless transmission of energy waves to said sensor unit, said sensor unit being constructed to at least partially surround the wall of the blood vessel to cause a first portion of the blood vessel to assume a flat shape and to enable the flat shaped portion of the blood vessel to move to a position in response to the blood pressure within the blood vessel, said sensor unit operating in response to said energy applied to said sensor unit by said externally located energy application unit to provide a wireless output signal indicative of the position of the flat shaped portion of the blood vessel, whereupon the blood pressure within the blood vessel may be determined.



6,015,387

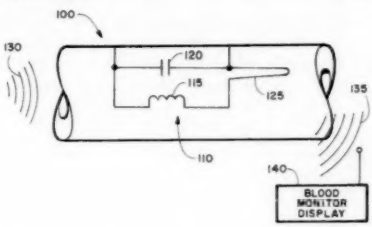
IMPLANTATION DEVICES FOR MONITORING AND REGULATING BLOOD FLOW

Robert S. Schwartz, Rochester; Robert A. VanTassel, Excelsior, and David R. Holmes, Rochester, all of Minn., assignors to MediVas, LLC, La Jolla, Calif.

Provisional application No. 60/041,172, Mar. 20, 1997. This application Mar. 19, 1998, Appl. No. 44,631.

Int. Cl.[7] A61B *5/02*

U.S. Cl. 600—504 **21 Claims**



1. A blood flow measurement apparatus comprising:

a hollow tubular body adapted for implantation within or around a blood vessel of a patient;

a sensor circuit coupled to said tubular body, said sensor circuit including a resonant circuit and serving as a conduit for electrical current flowing in a circuit within the blood vessel;

whereby said flow of current generates an electromagnetic signal indicative of blood flow.

6,015,388

METHOD FOR ANALYZING BREATH WAVEFORMS AS TO THEIR NEUROMUSCULAR RESPIRATORY IMPLICATIONS

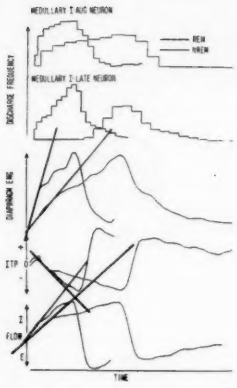
Marvin A. Sackner, Miami Beach, and D. Michael Inman, Miami, both of Fla., assignors to Nims, Inc., Miami Beach, Fla.

Provisional application No. 60/039,326, Mar. 17, 1997. This application Mar. 17, 1998, Appl. No. 40,144.

Int. Cl.[7] A61N *5/00*

U.S. Cl. 600—529 **37 Claims**

1. A method for measuring respiratory drive of a living subject, comprising the steps of:



monitoring a breath waveform of the subject;

determining from the monitored breath waveform one of a peak inspiratory flow and a peak inspiratory acceleration of the subject;

determining the respiratory drive of the subject from said determined one of the peak inspiratory flow and peak inspiratory acceleration.

6,015,389

IMPEDANCE PNEUMOGRAPHY

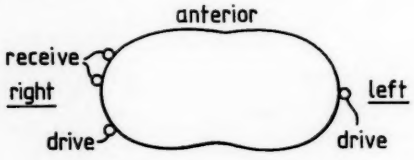
Brian Hilton Brown, Sheffield, United Kingdom, assignor to BTG International Limited, London, United Kingdom

Continuation of application No. PCT/GB96/03013, Dec. 5, 1996. This application Jun. 5, 1998, Appl. No. 90,997.

Claims priority, application United Kingdom, Dec. 6, 1995, 9524968

Int. Cl.[7] A61B *1/00*

U.S. Cl. 600—533 **17 Claims**



1. A method for monitoring respiratory condition by impedance pneumography, comprising the steps of applying a first pair of spaced electrodes to a human body, applying a second pair of spaced electrodes for detecting a resulting electrical signal at different points on the body, applying an electrical signal to the first pair of electrodes at a plurality of frequencies, monitoring the resulting electrical signal at the second pair of electrodes at said plurality of frequencies, obtaining from the resulting electrical signal a measure of the impedance of a part of the body at the plurality of frequencies, obtaining a difference signal representing the impedance change with frequency, and dividing the difference signal by a signal representative of the impedance measure itself at one or more frequencies, thereby suppressing the effect of those impedance signal components whose frequency dependent change is substantially proportional to the impedance signal value.

6,015,390

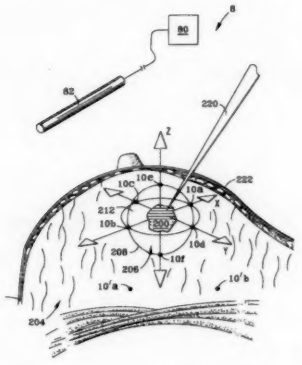
SYSTEM AND METHOD FOR STABILIZING AND REMOVING TISSUE

David N. Krag, Shelburne, Vt., assignor to D. Krag LLC, Shelburne, Vt.

Filed Jun. 12, 1998, Appl. No. 96,807

Int. Cl.[7] A61B *5/00*

U.S. Cl. 600—549 **20 Claims**



1. A system for use in stabilizing and removing a piece of tissue, the system comprising:

a. a plurality of sensors, each sensor including:

i. a temperature sensor for determining the temperature of the piece of tissue adjacent said each sensor, and for providing a first signal containing information that varies as a function of changes in said temperature;

ii. an antenna for receiving an interrogation signal containing a first identification code;

iii. a memory containing a second identification code;

iv. an ID decoder connected to said antenna and said memory for comparing said first identification code and said second identification code to assess whether said first identification code matches said second identification code; and

b. a scanner for providing said interrogation code.

6,015,391

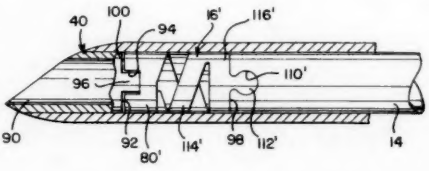
BIOPSY NEEDLE STRUCTURE

Michael Lyne Rishton; Harold Leonard Newman, both of Reading, Mass., and Alec Goldenberg, New York, N.Y., assignors to Medsol, Corp., New York, N.Y.

Filed Oct. 6, 1998, Appl. No. 167,230

Int. Cl.[7] A61B *10/00*

U.S. Cl. 600—567 **14 Claims**



1. A biopsy needle for removal of tissue from a patient of the type including an outer tube, an inner tube and a snare having first and second ends, the first snare end being coupled to said inner tube and said second snare end being coupled to said outer tube, said snare being movable between first and second positions by rotation of said inner tube with respect to said outer tube, wherein the improvement comprises:

an axially directed coupling element at said second snare end, said axially directed coupling element being one of a projection and slot;

the other of said projection and said slot being associated with said outer tube and arranged to engage said second snare end.

6,015,392

APPARATUS FOR SAMPLING BODY FLUID

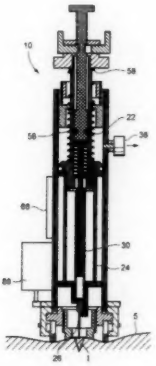
Joel S. Douglas, Santa Clara; Jeffrey N. Roe, San Ramon; Ryszard Radwanski, and Brent G. Duchon, both of San Jose, all of Calif., assignors to Mercury Diagnostics, Inc., Scotts Valley, Calif.

Continuation of application No. 08/858,045, May 16, 1997, Provisional application No. 60/017,133, May 17, 1996, Provisional application No. 60/019,918, Jun. 14, 1996, Provisional application No. 60/023,658, Aug. 1, 1996, Provisional application No. 60/025,340, Sep. 3, 1996, Provisional application No. 60/044,406, Oct. 8, 1996, Provisional application No. 60/064,856, Sep. 17, 1996, Provisional application No. 60/092,121, Sep. 16, 1996, Provisional application No. 60/727,074, Oct. 8, 1996. This application Sep. 24, 1998, Appl. No. 160,500.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61B *5/00*

U.S. Cl. 600—583 **3 Claims**



1. A device for obtaining a sample of body fluid through the skin comprising:

a housing member containing a hollow piercing element for piercing the skin;

a first spring member in the housing for urging the piercing element to protrude from a forward end of the housing sufficient to cut an incision through the skin;

a stop member for defining a maximum penetration depth of the piercing element;

a second spring in the housing for partially retracting the piercing element while maintaining a front end of the piercing element in the incision;

a tube communicating with a rear end of the hollow piercing element; and

a suction mechanism in the housing for creating a suction in the tube for drawing in body fluid through the piercing element.

6,015,393

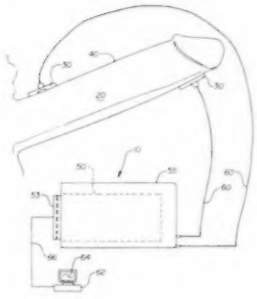
SYSTEMS AND METHODS FOR MONITORING AND EVALUATING PENILE TUMESCENCE

Claire T. Hovland, Minnetonka, Minn.; Roger Dixon, Bothell, Wash.; L. Dean Knoll, Brentwood, Tenn., and Jerome H. Abrams, St. Paul, Minn., assignors to UroMetrics, Inc., St. Paul, Minn.

Provisional application No. 60/041,684, Mar. 24, 1997, Provisional application No. 60/064,305, Nov. 5, 1997. This application Mar. 20, 1998, Appl. No. 45,599.

Int. Cl.[7] A61B *5/103*

U.S. Cl. 600—587 **49 Claims**



1. A method of monitoring the tumescent state of the penis of a patient, the method comprising:

(a) placing sensing elements in proximity to the penis;

(b) sensing impedance values of the penis both when the penis is in an erect state and when the penis is in a flaccid state with the sensing elements;

(c) determining at least one penile variable using the impedance values, the at least one penile variable being selected from the group consisting of length, volume, volume-change, and volume-filling rate variables; and

(d) using the at least one penile variable to generate a display output.

6,015,394

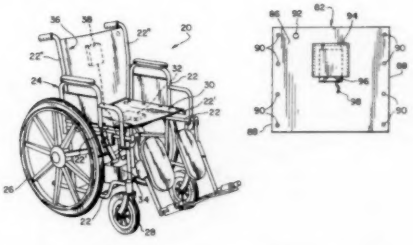
TISSUE STIMULATION APPARATUS FOR WHEELCHAIRS AND THE LIKE

Carol L. Young, 2724 Oliver, Fort Wayne, Ind. 46806

Filed Jun. 27, 1994, Appl. No. 267,040

Int. Cl.[7] A61H *23/02;23/04*

U.S. Cl. 601—55 **15 Claims**



1. A pouch assembly for attaching to a mobile device which supports a nonambulatory individual on a support surface which the individual rests upon, said pouch assemble comprising:

means for defining an internal cavity containing a fluid medium, said defining means including said support surface, said defining means including edges with grommets for attaching to a frame of the mobile device,said pouch assembly including a pocket; and

means for agitating the fluid medium in said internal cavity, said agitating means disposed in said pocket and oriented against said internal cavity whereby skin tissue of the individual on said support surface is stimulated to thereby deter the formation of skin sores.

6,015,395

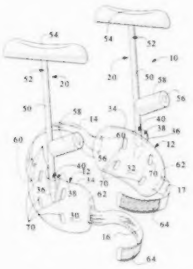
LOWER BACK SUPPORT

Hans Kautzky, 284 Church St., West Chicago, Ill. 60185-2706

Filed Mar. 6, 1998, Appl. No. 36,445

Int. Cl.[7] A61H *1/02*

U.S. Cl. 602—19 **21 Claims**



1. A back support device for an individual with a pair of ossa innominata pelvic bones each having an ilium, the back support device comprising:

a pair of crutches each having a shaft with a lower end, an upper end, and an armpit rest carried on the upper end;

a pair of connection joints that each transmit a load applied from the upper end to the lower end of a respective one of the crutches generally downward into their respective ilium, support and retain the lower end at a corresponding fixed point disposed above a respective one of the ilia, end to move in three rotational degrees of freedom about the corresponding fixed point according to movement of the individual, and permit uninhibited separation of the lower end from the connection joint upon immediate release of the load; and

a pair of hip plates each having a three dimensional curved shape for being received over one of the os innominatum pelvic bones, each hip plate having an inner surface with a surface area that contacts the individual and distributes the load over a majority of the surface area, and a curved upper edge adapted to extend at least partly over a respective one of the ilia and carry at least a portion of a respective one of the connection joints.

6,015,396

AUTOMATIC CANNULA WITHDRAWING DEVICE FOR INJECTION SYRINGES

Heinz Buttgen, Jona; Konrad Burger, Eschenbach; Tilo Callenbach; Karl Mazenauer, both of Jona; Daniel Riesen, Bubikon, and Daniel Vuille, Buchelstrasse 5, Ch-8732 Neuhaus, all of Switzerland, assignors to H. Weidmann AG Weidmann, Rapperswil, and Daniel Vuille, Neuhaus, both of Switzerland

PCT No. PCT/CH96/00243, § 371 Date Dec. 12, 1997, § 102(e) Date Dec. 12, 1997, PCT Pub. No. WO97/02060, PCT Pub. Date Jan. 23, 1997

PCT Filed Jul. 2, 1996, Appl. No. 981,540

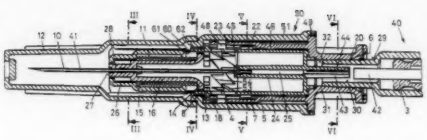
Claims priority, application Switzerland, Jul. 6, 1995, 1973/95

Int. Cl.[7] A61M *5/32*

U.S. Cl. 604—192 **25 Claims**

1. A hollow needle device comprising:

a hollow needle (**10**);



a housing (**51**) in which the hollow needle may be housed; and

a retraction device for retracting the hollow needle (**10**), after use, into the housing (**51**),

wherein the retraction device includes a selector switch device (**7.8**) which can be switched for retraction of the hollow needle (**10**) after its use,

wherein the selector switch device includes an equalization part (**7**) and by which during a selector switch process a negative pressure is produced to accept a fluid compressed during the retraction of the hollow needle (**10**).

6,015,397

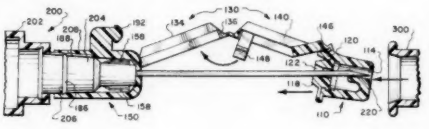
NEEDLE POINT GUARD SAFETY CAP ASSEMBLY

Edward E. Elson, 4356 Claytor Cir., Anaheim, Calif. 92806, and Lawrence R. Koh, 11755 Wilshire Blvd., 9th Flr., Los Angeles, Calif. 90025

Continuation-in-part of application No. 08/879,879, Jun. 20, 1997, Pat. No. 5,814,018. This application Sep. 24, 1998, Appl. No. 160,511.

Int. Cl.[7] A61M *5/00*

U.S. Cl. 604—192 **22 Claims**



1. A needle point guard safety cap assembly for securely covering and protecting the needle point of a syringe after the syringe has been used, comprising:

a) a syringe attachment member operable to firmly attach the needle point guard safety cap assembly to the needle hub of a syringe;

b) a needle point cover member in the form of an elongated hollow member that is open at one end for receiving the needle therein, and at its other end is mostly enclosed by an end wall having a hole through which the needle can pass;

c) a lid adapted to close the otherwise open end of the cover member, the lid also having a hole through which the needle may pass so that the needle may extend through both holes;

d) an extensible frame having a proximal end and a distal end, the proximal end coupled to the syringe attachment member and the distal end coupled to the needle point cover; the extensible frame being manually actuable for advancing the cover member along the needle to where the end wall of the cover member is beyond the extremity of the needle point;

e) the needle point cover member then being supported by the hole in the lid and then, in response to further advancement of the cover member, rotating about the lid hole until the needle point passes inside the enclosed end wall of the cover member into a protected position where it cannot pass through the cover member hole.

6,015,398

SYRINGE NEEDLE COATED WITH POLYORGANOSILOXANES

Yoshikazu Arimatsu, and Takeshi Nizuka, both of Osaka, Japan, assignors to Nissho Corporation, Osaka, Japan

Filed May 12, 1998, Appl. No. 75,848
Claims priority, application Japan, May 12, 1997, 9-121264
Int. Cl.[7] A61M *5/32*
U.S. Cl. 604—272 **9 Claims**

1. A coated syringe needle comprising a syringe needle coated on its surface with a mixture of:

(1) a first polyorganosiloxane selected from the group consisting of

(i) a reaction product of (a) a polyorganosiloxane having amino groups at both terminal ends and alkoxysilyl groups with (b) an epoxy group-containing alkoxysilane and

(ii) a reaction product of (a) a polyorganosiloxane having silanol groups with (b) another reaction product of an organosiloxane having amino groups at terminal ends with an epoxy group-containing alkoxysilane and

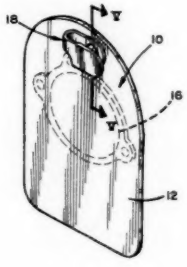
(2) a second non-reactive polyorganosiloxane, said second polyorganosiloxane having a lower average degree of polymerization of siloxane part than that of said first polyorganosiloxane.

6,015,399

OSTOMY PATIENT EQUIPMENT

Kellie Mracna, 1637 Pontiac, SE, and Hans Butterwegge, 1637 Pontiac, both of Grand Rapids, Mich. 49506

Provisional application No. 60/014,780, Apr. 3, 1996, abandoned. This application Apr. 2, 1997, Appl. No. 831,226.
Int. Cl.[7] A61F *5/44*
U.S. Cl. 604—332 **18 Claims**



1. A vented colostomy pouch comprising in combination:

an envelope-like container of thin, flexible waterproof material having a pair of opposite sides and upper and lower portions;

a waste aperture adapted to receive waste matter from a wearer;

a vent aperture extending through one of said sides at a location in the upper portion of said container;

an open-centered generally annular member secured to an exterior surface of said one of said sides in a position generally encircling said vent aperture to form a vent opening; and

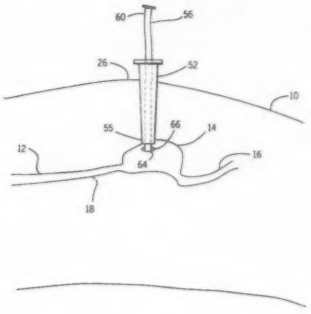
a plug-type closure member releasably and removably retained within said annular member to seal said vent opening, such that removal of said closure member vents the interior of said container through said opening and replacement of said closure member closes and reseals said opening.

6,015,400

METHOD FOR PLACING A FEEDING TUBE

Jeffrey R. Ross, Dublin, and Kathleen Rowland, Mason, both of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 5, 1998, Appl. No. 3,177
Int. Cl.[7] A61M *31/00*
U.S. Cl. 604—506 **13 Claims**



1. A method for placing a feeding tube in a patient, the method comprising the steps of:

providing a needle, said needle defining a channel therethrough, said needle constructed for insertion through an abdominal wall of a patient, said needle having a distal end portion and a proximal end portion;

inserting said distal end portion of said needle through an abdominal wall of a patient;

providing an endoscope constructed for insertion into said channel defined through said needle;

inserting said endoscope into said channel defined through said needle;

viewing an external environment of said distal end portion of said needle using said endoscope in order to determine whether said distal end portion of said needle is positioned within a preselected portion of a gastrointestinal tract of a patient;

providing a dilating device having a proximal end portion and a distal end portion, said dilating device defining a channel therethrough;

positioning said dilating device such that said proximal end portion of said needle is positioned within said channel defined through said dilating device;

urging said dilating device along said needle such that said distal end portion of said dilating device passes through an abdominal wall of a patient and into a preselected portion of a gastrointestinal tract of a patient;

removing said needle and said endoscope from a patient;

providing a feeding tube defining a channel therethrough, said feeding tube having a proximal end portion and a distal end portion;

placing said distal end portion of said feeding tube in said channel defined through said dilating device;

urging said feeding tube into said channel defined through said dilating device such that said distal end portion of said feeding tube is urged into a gastrointestinal tract of a patient; and

removing said dilating device from a patient.

6,015,401

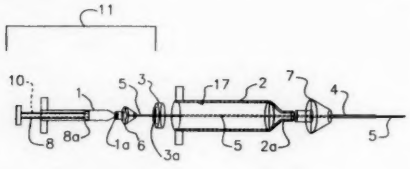
METHODS FOR VESSEL CANNULATION

Jacqueline Darlene Brackett, 8700 Dawes Lake Rd., Mobile, Ala. 36619, and Fred Brackett, 8255 Brackett La., Semmes, Ala. 36575

Continuation of application No. 08/605,280, Feb. 7, 1996, abandoned, which is a division of application No. 08/104,346, Aug. 9, 1993, Pat. No. 5,520,657. This application Apr. 24, 1998, Appl. No. 66,032.

Int. Cl.[7] **A61M** *5/00*

U.S. Cl. 604—506 **29 Claims**



1. A method of cannulation of a vessel utilizing an introducer needle telescoped over a seeker needle, comprising:

inserting a hollow seeker needle into the vessel;

aspirating fluid through the seeker needle to verify that the seeker needle is in the vessel; and

advancing the introducer needle over the seeker needle into the vessel.

6,015,402

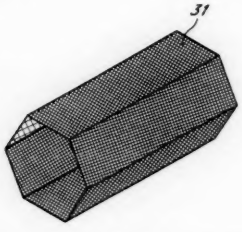
WIRE PERFUSION CATHETER

Harvinder Sahota, 3861 Wisteria St., Seal Beach, Calif. 90740

Division of application No. 08/813,478, Mar. 7, 1997, Pat. No. 5,800,393. This application Jun. 4, 1998, Appl. No. 90,504.

Int. Cl.[7] **A61M** *25/00*

U.S. Cl. 604—523 **5 Claims**



1. A stent for placement within a body lumen comprising:

a mesh material, said mesh material adapted to form a tube-like stent having a hexagonal cross-section.

6,015,403

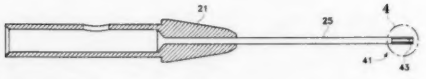
OPHTHALMIC SURGERY PROBE WITH SOFT TIP

Mark S. Jones, Ballwin, Mo., assignor to Alcon Laboratories, Inc.

Filed Feb. 26, 1996, Appl. No. 606,651

Int. Cl.[7] **A61B** *17/36;* **A61F** *9/00*

U.S. Cl. 606—4 **5 Claims**



1. An ophthalmic probe for ophthalmic surgery and the like comprising:

a handpiece having a handpiece body and a hollow needle of a size suitable for insertion into a human eye, said hollow needle extending distally from the handpiece body and including a metal tube forming the proximal portion of the needle;

a connector for connection to a laser source or a source of illumination;

an optical fiber terminating at one end in the connector and terminating at another end generally at the distal end of the needle for transmitting light from a light source to an eye to be treated; and

a soft tip disposed at the distal end of said needle and extending distally therefrom, said soft tip being molded in place on said needle;

said needle including an outer metal tube and an inner bushing, the inner bushing extending distally from the distal end of the outer metal tube, said inner bushing also having a proximal portion disposed inside at least a portion of the outer metal tube;

the soft tip being molded in place to the inner bushing.

6,015,404

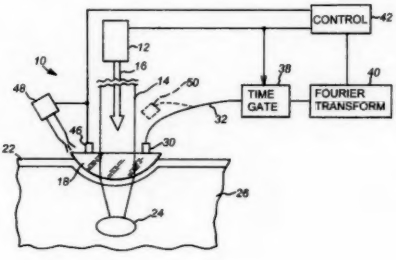
LASER DERMATOLOGY WITH FEEDBACK CONTROL

Gregory Altshuler, Beverly, Mass., and Andrei V. Erofeev, St. Petersburg, Russian Federation, assignors to Palomar Medical Technologies, Inc., Burlington, Mass.

Filed Dec. 2, 1996, Appl. No. 759,036

Int. Cl.[7] **A61N** *5/06*

U.S. Cl. 606—9 **9 Claims**



1. In a system for using a laser to treat a selected problem in a region at a selected depth in a patient's skin, a mechanism for reducing damage to the patient's epidermis overlying such region comprising:

a sensor for detecting at least a selected parameter of the patient's skin;

a feedback mechanism operative in response to an output from said sensor for performing a control function which protects said overlying epidermis from damage; and

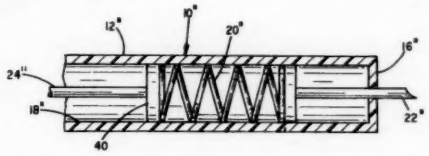
means for delivering two laser pulses to said region through said overlying epidermis, said pulses being spaced by a time related at least to the thermal relaxation time of the patient's epidermis, the first of said pulses being a prediagnosis pulse which is below a damage threshold for the patient's epidermis, the feedback mechanism being operative in response to the sensor output for said first pulse for controlling at least one parameter of the second pulse.

6,015,405

DEVICE FOR FORMING HOLES IN TISSUE

Robert S. Schwartz; David R. Holmes, both of Rochester, and Robert A. VanTassel, Excelsior, all of Minn., assignors to Tricardia, L.L.C., Excelsior, Minn.

Filed Jan. 20, 1998, Appl. No. 9,135
Int. Cl.[7] A61B 17/00;8/00
U.S. Cl. 606—16 11 Claims



1. Apparatus for forming holes of a predetermined depth and diameter dimension in selected tissue comprising:

(a) an elongated catheter having a proximal end a distal end and a lumen extending therebetween;

(b) a compression spring having first and second ends, the spring being of a predetermined length dimension when uncompressed with the first end being affixed proximate the distal end of the catheter and with the spring extending longitudinally therefrom; and

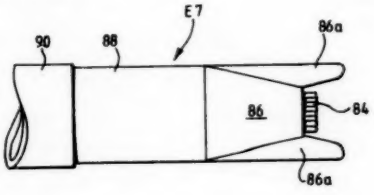
(c) a tissue ablating device operatively coupled to the second end of said compression spring such that upon actuation, said spring expands linearly to provide longitudal displacement of said tissue ablating device, and adapted to be pressed against said selected tissue with sufficient force to compress said spring with subsequent energization of the tissue ablating device ablating tissue distal to the tissue ablating device and allowing the spring to expand to its uncompressed length dimension.

6,015,406

ELECTROSURGICAL INSTRUMENT

Nigel Mark Goble, and Colin Charles Owen Goble, both of Cardiff, United Kingdom, assignors to Gyrus Medical Limited, Cardiff, United Kingdom

Filed Aug. 21, 1996, Appl. No. 701,811
Claims priority, application United Kingdom, Jan. 9, 1996, 9600377; Jun. 20, 1996, 9612996
Int. Cl.[7] A61B 17/39
U.S. Cl. 606—41 48 Claims



1. An electrosurgical instrument for the treatment of tissue in the presence of an electrically-conductive fluid medium, the instrument comprising:

an instrument shaft, and an electrode assembly at one end of the shaft;

the electrode assembly comprising a tissue treatment electrode and a return electrode which is electrically insulated from the tissue treatment electrode by means of an insulation member;

the tissue treatment electrode being exposed at the distal end portion of the instrument, and the return electrode having an exposed fluid contact surface spaced proximally from the exposed end of the tissue treatment electrode by the insulation member to an extent that the return electrode remains out of contact with tissue undergoing treatment by the tissue treatment electrode, so that electrical current flow between the tissue and the return electrode occurs only on a path through the conductive fluid medium;

the exposed end of the tissue treatment electrode is constituted by a plurality of tissue treatment filamentary members made of an electrically-conductive material, the filamentary members being electrically connected distally of the insulation member to a common electrical supply conductor; and

wherein the insulation member is formed with a least one wing, said at least one wing extending distally from the insulation member at a side of the tissue treatment electrode to project beyond the tissue treatment electrode.

6,015,407

COMBINATION LINEAR ABLATION AND COOLED TIP RF CATHETERS

Dale Rieb, Sunnyvale; Lorna Fosse, San Jose, and Mark L. Pomeranz, Los Gatos, all of Calif., assignors to Cardiac Pathways Corporation, Sunnyvale, Calif.

Continuation of application No. 08/611,656, Mar. 6, 1996, Pat. No. 5,800,482. This application Mar. 27, 1998, Appl. No. 49,332.
Int. Cl.[7] A61B 17/39
U.S. Cl. 606—41 33 Claims

1. A catheter for ablating body tissue, comprising:

a shaft having a bendable distal section and a distal end;

a tip electrode having a chamber formed therein and attached to the distal end of the shaft;

an ablation element carried on the distal section of the shaft; and,

means for delivering current to the tip electrode;

means for delivering current to the ablation element;

means for delivering fluid to the tip electrode chamber to cool the tip electrode during use; and,

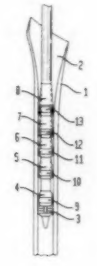
means for withdrawing the fluid from the tip electrode.

6,015,408

APPARATUS FOR IMPACTING BONE CHIPS IN A BONE CANAL

Denis Pichon, Bieville-Beuville, and John Andrew Storer, Bayeux, both of France, assignors to Howmedica International Inc., Ireland

Filed Jun. 30, 1998, Appl. No. 107,270
Claims priority, application United Kingdom, Jul. 2, 1997, 9714003
Int. Cl.[7] A61B 17/56
U.S. Cl. 606—53 16 Claims



1. A kit including an apparatus for impacting bone chips in a bone canal of a bone having a longitudinal axis and having a reference position marked on said bone with respect to said axis,

comprising a series of impactors each having an impaction head of predetermined different diametrical dimensions and a stem extending therefrom, and position indicators selectively engagable with each of said stems at a position therealong corresponding to the reference position on the bone.

6,015,409

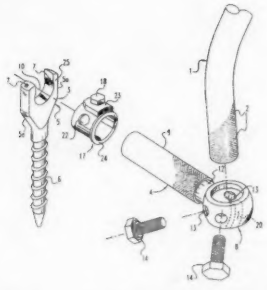
APPARATUS AND METHOD FOR SPINAL FIXATION AND CORRECTION OF SPINAL DEFORMITIES

Roger P. Jackson, Prairie Village, Kans., assignor to SDGI Holdings, Inc., Wilmington, Del.

Continuation of application No. 08/759,524, Dec. 4, 1996, abandoned, which is a continuation of application No. 08/244,435, May 25, 1994, Pat. No. 5,591,165. This application Oct. 10, 1997, Appl. No. 948,594.

Int. Cl.[7] **A61B** *17/70*

U.S. Cl. 606—61 **1 Claim**



1. A connection element for connecting a spinal osteosynthesis rod to a fixation element engaged to a vertebra to be treated comprising:

an elongated arm, the arm having means for supporting the fixation element while permitting rotation and translation of the fixation element about said arm;

a one piece, closed ring integrally carried at one end of said arm, said ring sized to receive the spinal osteosynthesis rod therethrough; and

means for fixing said arm to the rod.

6,015,410

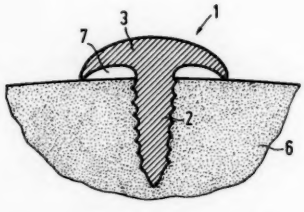
BIOABSORBABLE SURGICAL IMPLANTS FOR ENDOSCOPIC SOFT TISSUE SUSPENSION PROCEDURE

Pertti Törmälä; Markku Tamminmäki; Pertti Helevirta, all of Tampere, Finland, and Dennis M. Nigro, Encinitas, Calif., assignors to Bionx Implants Oy, Tampere, Finland

Filed Dec. 23, 1997, Appl. No. 997,458

Int. Cl.[7] **A61B** *17/00*

U.S. Cl. 606—73 **7 Claims**



1. A bioabsorbable surgical implant for use in combination with sutures in supporting soft tissue in a position in a body, the surgical implant comprising:

a shaft having a distal end and a proximal end; and

a head having a convex outer surface and a continuous concave lower surface extending from said proximal end of said shaft to an edge of said convex outer surface, said proximal end of said shaft being integrally to said continuous concave lower surface of said head.

6,015,411

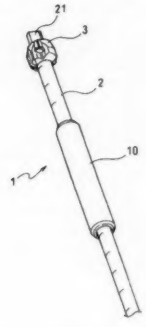
BONE EXCAVATING APPARATUS FOR REPAIRING LIGAMENT AND A BONE TUNNEL FORMING METHOD

Yasumitsu Ohkoshi, Hokkaido, and Fumihito Naito, Aichi, both of Japan, assignors to Nagoya Screw Mfg. Co., Ltd., Nagoya, Japan

Filed Feb. 25, 1998, Appl. No. 30,423

Int. Cl.[7] **A61B** *17/16*

U.S. Cl. 606—80 **14 Claims**



1. A bone-excavating apparatus for repairing a ligament, comprising:

a rod-shaped shaft;

a drill having a bone-excavating blade formed thereon such that the drill is insertable into an articulation from a cut portion thereof and installable on the shaft and removable from the shaft, wherein the drill and shaft on which the drill has been installed constitute a drill-locking mechanism for preventing the drill from being moved to a base side of the shaft;

a torque transmission mechanism for transmitting, to the drill, a rotational force applied to the shaft in a direction in which a bone-excavating blade is allowed to excavate the bone; and

a shaft removal prevention mechanism for allowing an engagement of the shaft with the drill when the shaft is pulled toward the base side thereof;

wherein said drill has two grooves provided to the lateral thereof and extending axially and facing each other and concavities provided to the lateral thereof and facing each other and formed on each of the grooves.

6,015,412

CUTTING DEVICE

Simon Mifsud, Harrogate, United Kingdom, assignor to Atlantech Medical Devices Limited, North Yorkshire, United Kingdom

Filed Jan. 6, 1998, Appl. No. 3,340

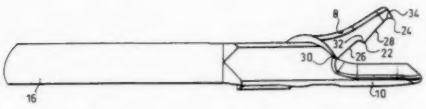
Claims priority, application United Kingdom, Jan. 8, 1997, 9700236; Sep. 12, 1997, 9719317

Int. Cl.[7] **A61B** *17/56;17/32*

U.S. Cl. 606—83 **20 Claims**

1. A cutting device for cutting tissue during endoscopic surgery comprising:

first and second co-operating opposed jaw parts which are operable to close together to cut an object placed there between; and



a gripping member to grip the object during an initial part of a jaw closing action,

wherein the gripping member extends from one of the jaw parts, between a hinge and a front of the jaw parts, substantially in a direction of an opposite jaw part so that material placed between said jaw parts is held by the gripping member and prevented from sliding forward in a direction of the front of the jaw parts as the jaw parts close together, and

wherein only one said gripping member is provided between the hinge and the front of the jaw parts.

6,015,413

DEVICE FOR THE EXTRACTION OF SCREW-THREADED WIRES PARTICULARLY FOR ORTHOPAEDIC SURGICAL OPERATIONS

Giovanni Faccioli, Monzambano; Daniele Venturini, Povegliano Veronese, both of Italy, and Dietmar Pennig, Köln, Germany, assignors to Orthofix S.r.l., Bussolengo, Italy

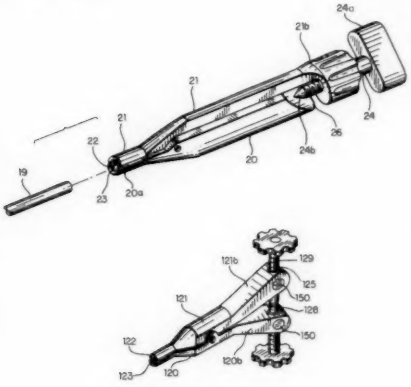
PCT No. PCT/IB96/00155, § 371 Date Dec. 22, 1997, § 102(e) Date Dec. 22, 1997, PCT Pub. No. WO97/00648, PCT Pub. Date Jan. 9, 1997

PCT Filed Feb. 29, 1996, Appl. No. 981,513

Claims priority, application Italy, Jun. 20, 1995, VR95A0055

Int. Cl.[7] **A61B** *17/58;17/60*

U.S. Cl. 606—104 **12 Claims**



1. Device for extracting screwthreaded wires for osteosynthesis, comprising at least two lever pieces (**20**–**21**, **120**–**121**, **220**–**221**) hinged together and having at one longitudinal end thereof (**20***a*–**21***a*, **120***a*–**121***a*, **220***a*–**221***a*) seats or jaws (**22**–**23**, **122**–**123**, **222**–**223**) for grasping the end of a wire (**19**) which is required to be extracted, and manually operable clamp means acting on the other end (**20***b*–**21***b*, **120***b*–**121***b*, **220***b*–**221***b*) of said lever pieces to promote opening or closing thereof to thereby generate at least one gripping couple on the end of the wire, and characterized in that said clamp means are provided with means (**24**–**25**, **128**–**129**, **224**–**230**) for preventing relaxation of the grip on the end of the wire to be extracted, and said seats are provided with means (**21**–**23**, **122**–**123**, **222**–**223**) for gripping the end of the wire, said relaxation-preventing means (**24**–**25**, **128**–**129**, **224**–**230**) including at least a threaded pin (**24***a*, **124**, **224**) mounted at one end of one of the lever pieces for selectively locking the end of the other lever piece, said gripping means (**22**–**23**, **122**–**123**, **222**–**223**) having semicylindrical cavities whose diameter is approximately equal to the diameter of the wire to be extracted and whose longitudinal axis is coaxial with the longitudinal axis of the device, and having a first cylindrical end part (**20***a*–**21***a*, **120***a*–**121***a*, **220***a*–**221***a*) whose diameter is slightly greater than the diameter of the wire to be extracted and a second, generally frustoconical part joining said first part and a generally cylindrical central part of the two lever pieces thereby to enable the wire to be gripped beneath the surface of the skin.

6,015,414

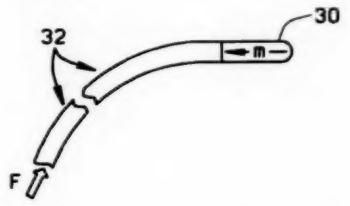
METHOD AND APPARATUS FOR MAGNETICALLY CONTROLLING MOTION DIRECTION OF A MECHANICALLY PUSHED CATHETER

Peter R. Werp, Los Gatos, Calif.; Walter M. Blume, Webster Groves; Francis M. Creighton, IV, St. Louis, both of Mo., and Rogers C. Ritter, Charlottesville, Va., assignors to Stereotaxis, Inc., St. Louis, Mo.

Filed Aug. 29, 1997, Appl. No. 920,446

Int. Cl.[7] **A61F** *11/00*

U.S. Cl. 606—108 **37 Claims**



1. A method for controlling movement of a catheter through a medium, the method comprising the steps of:

(a) mechanically pushing a flexible catheter having a magnetic tip through the medium; and

(b) applying a magnetic field having a magnitude and an orientation effective to guide the mechanically-pushed catheter tip in a predetermined direction.

6,015,415

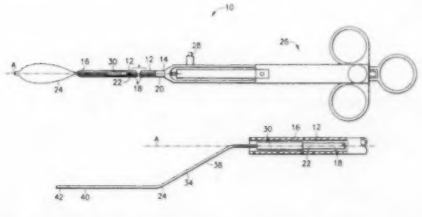
POLYPECTOMY SNARE INSTRUMENT

Francisco J. Avellanet, Coral Gables, Fla., assignor to General Science and Technology, Miami, Fla.

Filed Mar. 9, 1999, Appl. No. 264,772

Int. Cl.[7] **A61B** *17/22;17/38*

U.S. Cl. 606—113 **23 Claims**



14. A surgical snare instrument, comprising:

a) an elongate flexible tubular sheath having proximal and distal ends, said distal end having a longitudinal axis;

b) a flexible shaft having proximal and distal ends, said flexible shaft extending through and axially movable relative to said sheath;

c) a snare loop provided at said distal end of said flexible shaft, said snare loop having a proximal portion biased to extend non-axially relative to said longitudinal axis and a distally-

directed distal portion biased to extend substantially parallel to said longitudinal axis; and

d) a handle assembly coupled to said sheath and said flexible shaft and configured to move at least one of said shaft and said sheath axially relative to the other.

6,015,416

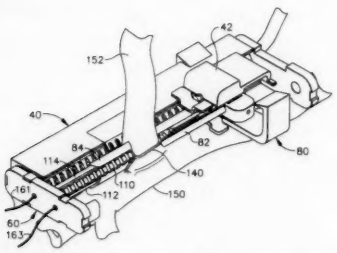
SURGICAL ANASTOMOSIS INSTRUMENT

David Stefanchik, Mason; David L. Hamann, Cincinnati; John B. Flege, Jr., Cincinnati; Douglas N. Ladd, Cincinnati; J. Renee Lupton, West Chester, all of Ohio, and James A. Craft, Lexington, Ky., assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Filed Feb. 26, 1998, Appl. No. 31,346

Int. Cl.[7] A61B *17/04*

U.S. Cl. 606—144 **25 Claims**



1. A surgical device for attaching a first hollow organ to a second hollow organ and creating a passageway therebetween, said surgical device comprising:

a) a first means for holding said first hollow organ, and a second means for holding said second hollow organ, said first and second means having proximal ends attached to said surgical device, distal ends extending therefrom and longitudinal axis extending therebetween, said surgical device including means for moving at least one of said first and second means adjacent to the other so as to move said hollow organs close together;

b) a plow having a proximal end, a distal end extending therefrom and a longitudinal axis extending therebetween, said plow for incising at least one of said hollow organs so as to create a passageway between said hollow organs; and

c) a frame for coupling said first and second means and said plow together in operational engagement, said surgical device further including a means for driving a needle, having a suture attached thereto, through said organs, about said passageway thereby attaching said hollow organs together.

6,015,417

SURGICAL FASTENER

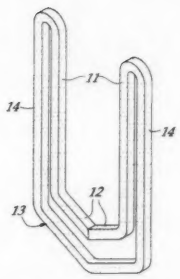
Walker Reynolds, Jr., 14 Rendalia Dr., Anniston, Ala. 36201

Continuation-in-part of application No. 08/591,337, Jan. 25, 1996, abandoned. This application Aug. 12, 1997, Appl. No. 909,746.

Int. Cl.[7] A61B *17/00*

U.S. Cl. 606—151 **7 Claims**

2. A surgical fastener for use in a surgical applicator, said fastener comprising an elongated member having a pair of legs wherein each of said legs is folded back on itself to form separate inner and outer contiguous segments, whereby tissue is received between said inner segments such that when said fastener is applied to the tissue with said applicator, each outer segment abuts its contiguous inner segment such that said inner segments are compressed into sealing engagement with the tissue and said outer segments provide reinforcement to said inner segments, wherein said fastener further comprises a textured feature to increase a



gripping effect of said fastener, said textured feature comprising a coating containing a plurality of solid particles, wherein said particles form protrusions in said coating.

6,015,418

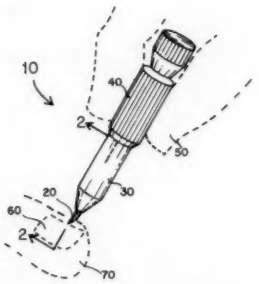
FINGERNAIL AND TOENAIL DRILL

Tyler R. Wymond, 2694 Stony Fork Way, Boise, Id. 83706

Filed Nov. 19, 1997, Appl. No. 974,523

Int. Cl.[7] A61B *17/32*

U.S. Cl. 606—167 **11 Claims**



1. A drilling instrument for use on a nail of a human appendage, the drilling instrument comprising:

a shaft having a tip and a body and a longitudinal axis, the body having a proximal end opposite the tip and the body being solid in radial cross-section in at least one location along its longitudinal axis, the tip having a single sharp point and being hollow at the sharp point;

a handle connected to said shaft for grasping by a user for causing the shaft to drill through the nail.

6,015,419

RETRACTABLE SURGICAL SCALPEL

Scott E. Strome, Rochester, and Edward T. Joseph, Inver Grove Heights, both of Minn., assignors to Strome Steel Surgical, Inc., Ann Arbor, Mich.

Filed Aug. 31, 1998, Appl. No. 143,833

Int. Cl.[7] A61B *17/32*

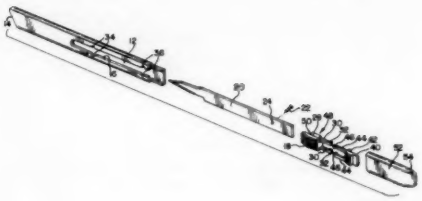
U.S. Cl. 606—167 **20 Claims**

1. A surgical instrument comprising:

a hollow handle having an end slot and a side slot;

retraction means for securably moving a scalpel blade between first and second positions relative to the handle, one of which is an extended, in-use position wherein the scalpel blade extends out of the handle through the end slot, and the other of which is a retracted, non-use position wherein the scalpel blade is wholly disposed within the handle;

the retraction means including a first sliding element securable to a scalpel blade and having at least one finger extending



therefrom, the finger having a first contoured portion engageable, when the retraction means is in the first position, with a second contoured portion of the handle, wherein the first and second contoured portions are substantially complementary such that the finger must deflect to permit disengagement of the first contoured portion of the finger from the second contoured portion of the handle so that the retraction means can be moved from the first position toward the second position; and

locking means for locking the retraction means in one of the first and second positions;

the locking means including a second sliding element moveable between a locked position and an unlocked position and having a cam that permits deflection of the finger of the first sliding element when the second sliding element is in the unlocked position and substantially inhibits deflection of the finger of the first sliding element when the second sliding element is in the locked position.

6,015,420

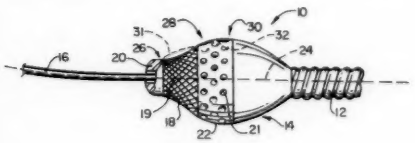
ATHERECTOMY DEVICE FOR REDUCING DAMAGE TO VESSELS AND/OR IN-VIVO STENTS

Edward Wulfman, Woodinville; Lucas Gordon, Redmond; Robert Barry, Kirkland; Brandon Shuman, Seattle; David Dillard, Redmond, and Verivada Chandrasekaran, Mercer Island, all of Wash., assignors to SCIMED Life Systems, Inc., Maple Grove, Minn.

Continuation-in-part of application No. 08/813,827, Mar. 6, 1997, abandoned. This application Mar. 5, 1998, Appl. No. 35,734.

Int. Cl.[7] A61B *17/32*

U.S. Cl. 606—168 **31 Claims**



1. An ablation burr for removing deposits from a patient's vessel or stent, comprising:

a burr body having a distal end and a proximal end and a concave leading outer surface, the concave leading outer surface having a radius that increases from a smooth distal tip at the distal end of the burr to a point that is proximal to the smooth distal tip, wherein the concave leading outer surface includes an abrasive that removes deposits from the patient's vessel or stent.

6,015,421

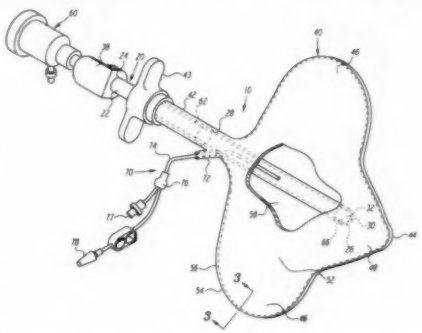
APPARATUS AND METHOD FOR DEVELOPING AN ANATOMIC SPACE FOR LAPAROSCOPIC PROCEDURES

Jan M. Echeverry, San Jose; Luis M. Fernandez, Palo Alto; James E. Jervis, Atherton; Janine C. Robinson, Half Moon Bay; Shigeru Tanaka, Palo Alto, and Laveille K. Voss, Belmont, all of Calif., assignors to General Surgical Innovations, Inc., Cupertino, Calif.

Filed May 15, 1997, Appl. No. 857,193

Int. Cl.[7] A61M *29/00*

U.S. Cl. 606—190 **30 Claims**



1. A laparoscopic apparatus for creating an anatomical working space between tissue layers in a body, said apparatus comprising:

a tunneling member comprising a substantially rigid shaft having open proximal and distal ends, and having a passage extending therethrough between said proximal and distal ends, said passage being adapted to receive a laparoscope therein, said distal end including a "U" shaped lip thereon adapted to retain the laparoscope from extending beyond said distal end, and to enhance a field of view axially through said distal end; and

a balloon having an inflatable space and being capable of assuming collapsed and inflated conditions, said balloon having a proximal sleeve for receiving said distal end of said tunneling member therein.

6,015,422

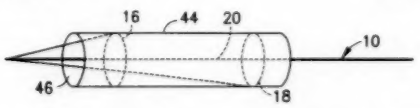
COLLAPSIBLE LOW-PROFILE VASCULAR GRAFT IMPLANTATION INSTRUMENT AND METHOD FOR USE THEREOF

Andrew Kerr, New York, N.Y., assignor to Montefiore Hospital and Medical Center, Bronx, N.Y.

Filed Feb. 18, 1998, Appl. No. 25,713

Int. Cl.[7] A61M *29/00*

U.S. Cl. 606—191 **16 Claims**



1. A device for treating blood vessel anomalies, said device comprising a tubular vascular graft, the vascular graft being formed about a longitudinal axis with an inner surface extending the length of the vascular graft about the longitudinal axis, and a first flexible guidewire formed to define a collapsible loop and a segment, said loop being resiliently formed with memory to self-expand from a collapsed state to a natural, non-collapsed state, said loop encircling the longitudinal axis of the vascular graft and supporting portions of the inner surface of the vascular graft, wherein a first portion of said segment is integrally connected to said loop and extends therefrom in a direction continuously angu-

lar to the longitudinal axis of the graft, a second portion of said segment is integrally connected to and extends from said first portion through at least a portion of the vascular graft.

6,015,423

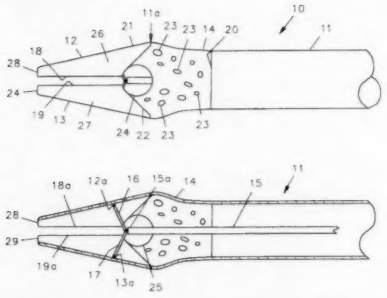
DILATATION CATHETER TIP FOR ANGIOPLASTY PROCEDURES

Craig A. Andrese, 128 Stirrup La., Burr Ridge, Ill. 60521

Provisional application No. 60/081,442, Apr. 10, 1998. This application May 12, 1998, Appl. No. 76,421.

Int. Cl.[7] A61M *29/00*

U.S. Cl. 606—198 **14 Claims**



1. A dilatation catheter for use in angioplasty and other lumenal dilatation procedures, an expandable lumen distal tip comprising,

a pair of substantially rigid semi-conical jaw means positioned adjacent a distal end of said catheter for providing a controllable mechanical expansion of the distal tip of said catheter,

hinge means positioned between each of said pair of jaw means for restraining movement of a base of each of said jaw means relative to the other of said jaw means,

control means for expanding and contracting a distal end of said jaw means from a position remote from said expandable lumen distal tip, and

fluid passageway means therethrough for providing a path for fluid flow through said expandable lumen tip while said catheter is being used.

6,015,424

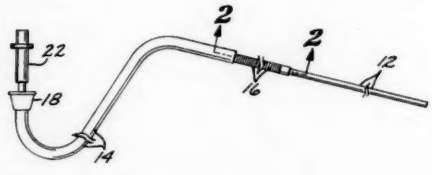
APPARATUS AND METHOD FOR VASCULAR EMBOLIZATION

Robert F. Rosenbluth; Brian J. Cox, both of Laguna Niguel, and George R. Greene, Jr., Costa Mesa, all of Calif., assignors to MicroVention, Inc., Aliso Viejo, Calif.

Filed Apr. 28, 1998, Appl. No. 69,008

Int. Cl.[7] A61M *29/00*

U.S. Cl. 606—200 **34 Claims**



1. Apparatus for vascular embolization that is deployable through a microcatheter having an axial lumen, comprising:

a flexible, elongate, hollow deployment tube dimensioned for insertion through the lumen of the microcatheter, the deployment tube having a proximal end and a distal end; and

a filamentous embolic device having a proximal end releasably attached to the distal end of the deployment tube, the embolic device being controllably transformable from a soft, compliant state to a rigid or semi-rigid state.

6,015,425

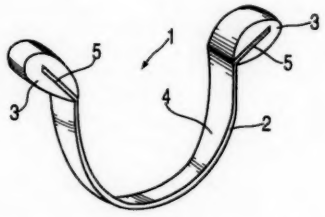
NASAL AIR FRESHENER FOR DENTAL PATIENTS

James Altadonna, Jr., 203 Whitewood Dr., Massapequa Park, N.Y. 11762

Filed Dec. 9, 1998, Appl. No. 208,525

Int. Cl.[7] A61F *5/08*

U.S. Cl. 606—204.45 **11 Claims**



1. An odor desensitizing intra-nasal clip for dental patients, comprising:

a bendable arcuate band extending between distal ends, said ends having odor-emitting means affixed thereon;

said band having an inner surface coextensive with said band, said inner surface for intra-nasal contacting the respective right and left sides of a user's nasal septum, when said distal ends are inserted into a user's right and left nostrils with said band wrapped around the distal end of the nasal septum;

said band having a pair of reverse curvatures near said respective distal ends, said reverse curvatures providing for separation of said ends from contact with the surface of the user's nasal septum.

6,015,426

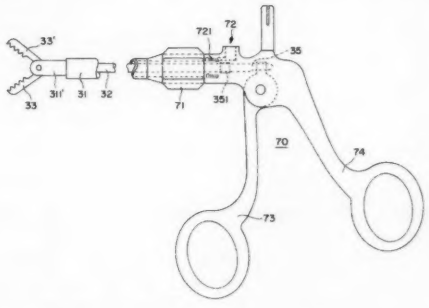
ROTATABLE LINKAGE FOR MICRO-INSTRUMENT

Jerry Richard Griffiths, Pembroke, Mass., assignor to TNCO, Inc., Whitman, Mass.

Continuation of application No. 08/274,642, Jul. 13, 1994, abandoned. This application Feb. 27, 1997, Appl. No. 807,320.

Int. Cl.[7] A61B *17/00*

U.S. Cl. 606—205 **20 Claims**



1. A miniature articulated tip tool assembly comprising:

(a) an elongated housing defining a channel therein and having at a distal end thereof a pivotal mounting for at least one jaw member;

(b) an elongated drive member positioned within said channel terminating at its distal end in a bearing characterized in being (i) rotationally symmetric about the longitudinal axis of said drive member, (ii) round in longitudinal cross section at its distal end, and (iii) greater in diameter at its widest radial cross section than at its proximal end;

(c) at least one single-piece actuating link defining a seat for engaging said bearing and a surface for transmitting force parallel to the longitudinal axis of said drive member, but separated therefrom by a radial moment arm, said link engaging at said seat said bearing allowing, between said link and said bearing, (i) full rotation about the longitudinal axis, (ii) limited rotation in the plane of said moment arm; and (iii) substantially no other relative motion; and

(d) at least one jaw member mounted for rotation on said pivotal mounting and engaging, at a point separated from said pivotal mounting as projected upon the plane of said jaw rotation, said force-transmitting surface of said link.

6,015,427

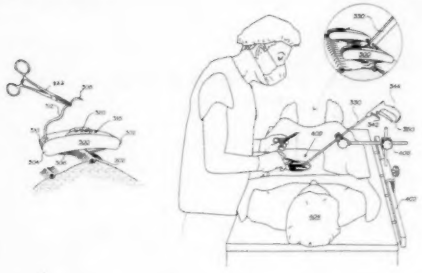
HEART STABILIZER WITH CONTROLLABLE STAY SUTURE AND CUTTING ELEMENT

Richard L. Mueller; Steve A. Daniel, and Stuart D. Harman, all of Sunnyvale, Calif., assignors to Eclipse Surgical Technologies, Inc., Sunnyvale, Calif.

Filed Jul. 7, 1997, Appl. No. 882,774

Int. Cl.[7] A61B *17/00*

U.S. Cl. 606—232 **33 Claims**



1. A heart stabilizer and suture control device for stabilizing the heart and for occluding a preselected portion of one or more coronary arteries, the device comprising:

two stabilization pads, the stabilization pads each having an operative size and shape;

a tension suture coupled to each stabilization pad, the sutures each having a distal end to be fixed in place to the stabilization pads, the sutures each also having a proximal end which can be coupled to the stabilization pads; and

a suture controller, such that when operatively positioned adjacent one or more coronary arteries to be occluded, the tension sutures associated with each stabilization pad can be tightened or loosened to cause changes in the occlusion forces on the one or more coronary arteries as desired.

6,015,428

INTEGRALLY FORMED SUTURE AND SUTURE LOCK

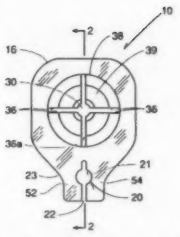
Anthony C. Pagedas, 8401 W. Edgerton, Greendale, Wis. 53129, assignor to Anthony C. Pagedas

Provisional application No. 60/048,489, Jun. 3, 1997. This application Jun. 3, 1998, Appl. No. 89,916.

Int. Cl.[7] A61B *17/04*

U.S. Cl. 606—232 **7 Claims**

1. A self adjusting self locking suture lock to be used with surgical suture thread and suture needle, said self adjusting self locking suture lock comprising a body having a front side, a back



side, a first edge, a thread retaining opening, and a stitch lock opening; the thread retaining opening having a thread opening slightly smaller in diameter than said suture thread and a slot extending outwardly from said thread opening to said first edge; the stitch lock opening having mounted therein an elastic plug capable of creating sufficient frictional pressure on said suture material to secure a stitch.

6,015,429

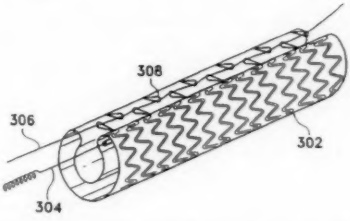
PROCEDURES FOR INTRODUCING STENTS AND STENT-GRAFTS

Lilip Lau, Sunnyvale; Charles T. Maroney, Portola Valley; William M. Hartigan, Fremont, and Sharon Lam, San Jose, all of Calif., assignors to Gore Enterprise Holdings, Inc., Newark, Del.

Division of application No. 08/361,793, Dec. 21, 1994, abandoned, which is a continuation-in-part of application No. 08/303,060, Sep. 8, 1994, abandoned. This application Mar. 12, 1996, Appl. No. 615,016.

Int. Cl.[7] A61F *2/06*

U.S. Cl. 623—1 **44 Claims**



1. A method for preparing a self-expanding stent-graft further comprises:

providing a stent-graft which includes a stent and a graft;

folding said self-expanding stent-graft around a longitudinal axis to form at least one longitudinal fold line; and

introducing a removable slip line into the stent of said stent-graft along said at least one longitudinal fold line, to maintain said stent-graft in a folded condition, and which upon removal allows said stent-graft to unfold.

6,015,430

EXPANDABLE STENT HAVING A FABRIC LINER

William H. Wall, 5139 Jimmy Carter Blvd., Norcross, Ga. 30093

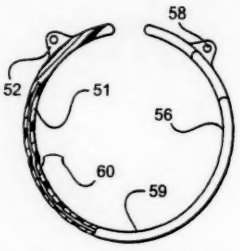
Continuation-in-part of application No. 08/578,504, Dec. 26, 1995, Pat. No. 5,824,238, which is a continuation-in-part of application No. 08/129,834, Dec. 8, 1987. This application Jun. 21, 1996, Appl. No. 667,604.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61F *2/06*

U.S. Cl. 623—1 **15 Claims**

1. Apparatus for use in maintaining an opening within a vessel, said apparatus comprising a stent having a wall expandable from a



first position providing a collapsed diameter of said stent, and a second position providing an expanded diameter of said stent, a catheter assembly receivable within the vessel, said stent configured to be carried on a first catheter, said catheter assembly including said first catheter for carrying said stent, and a second catheter disposed within said first catheter and coaxial with said first catheter, said second catheter including a inflatable balloon which is inflated while said catheter is within the vessel, whereby said first catheter carries said stent adjacent to said balloon so that said stent can be placed over said balloon, said balloon is inflated to open said stent to said expanded diameter such that said stent is left in place in the vessel, after said balloon performs angioplasty, said stent having internally a tubular fabric liner of substantially the same length as said stent;

6,015,431

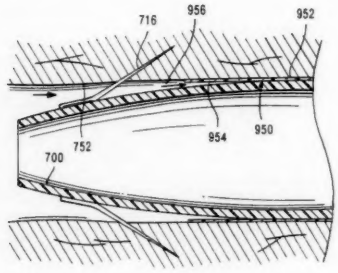
ENDOLUMENAL STENT-GRAFT WITH LEAK-RESISTANT SEAL

Troy Thornton, San Francisco, and Lilip Lau, Sunnyvale, both of Calif., assignors to Prograft Medical, Inc., Palo Alto, Calif.

Filed Dec. 23, 1996, Appl. No. 773,479

Int. Cl.[7] A61F *2/06*

U.S. Cl. 623—1 **23 Claims**



1. A device comprising:

a self-expanding substantially tubular stent-graft, said stent-graft having an outer surface and upstream and downstream ends;

a seal member secured to the outer surface of said stent-graft adjacent said upstream end, said seal member comprising an occlusive cuff having a downstream cuff end secured to said outer surface and an unsecured upstream cuff end actuatable to form a seal over said outer surface; and

a plurality of anchor members spaced around the outer surface of said stent-graft upstream of said seal member, said anchor members having first anchor end portions secured to said outer surface and second anchor end portions extending radially outward from said outer surface.

6,015,432

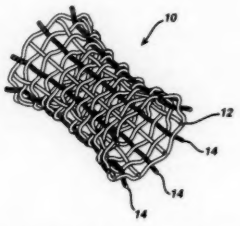
WIRE REINFORCED VASCULAR PROSTHESIS

Ronald Rakos, Monmouth Junction; Signe Mary Lund, Bedminster, and Charles V. Tomonto, Neshanic Station, all of N.J., assignors to Cordis Corporation, Miami Lakes, Fla.

Filed Feb. 25, 1998, Appl. No. 30,408

Int. Cl.[7] A61F *2/06*

U.S. Cl. 623—1 **16 Claims**



1. A prosthesis comprising a non-metallic woven graft material, said woven graft material having a plurality of openings in its structure; and at least one essentially straight wire emplaced in said plurality of openings in an alternating fashion so as to describe a weave.

6,015,433

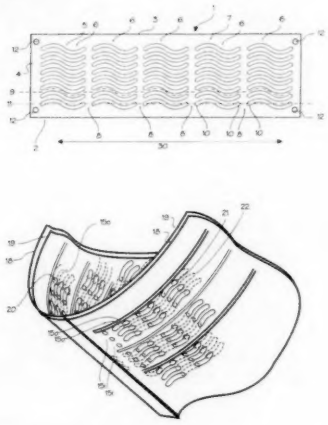
ROLLED STENT WITH WAVEFORM PERFORATION PATTERN

Noah M. Roth, San Clemente, Calif., assignor to Micro Therapeutics, Inc., Irvine, Calif.

Filed May 29, 1998, Appl. No. 87,600

Int. Cl.[7] A61F *2/06*

U.S. Cl. 623—1 **4 Claims**



4. A stent comprising:

a sheet of material, said sheet being capable of rolling into a tubular structure having at least two layer, said sheet characterized by a transverse edge which, in the rolled tubular structure corresponds to the circumference of the stent, said sheet characterized by a longitudinal edge which, in the rolled tubular structure corresponds to the longitude of the stent;

said sheet being perforated by a plurality of perforations, said perforations shaped as sinusoidal waves, said perforations being placed on the sheet so that a first group of said perforations are circumferentially aligned along a first longitudinal location on the stent, and a second group of said perforations are circumferentially aligned along a second longitudinal location on the stent, and subsequent groups of perforations

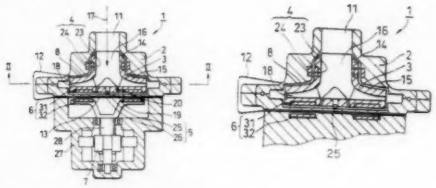
are likewise circumferentially aligned along length of the stent, thus forming a plurality of generally circumferentially extending sinuous hoops connected by longitudinally extending staves in the stent.

6,015,434

ARTIFICIAL HEART PUMP

Takashi Yamane, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Jul. 23, 1997, Appl. No. 899,337
Claims priority, application Japan, Jul. 26, 1996, 8-215242
Int. Cl.[7] A61M *1/10*
U.S. Cl. 623—3 **2 Claims**



1. An artificial heart pump comprising:

a casing having a blood inlet, a blood outlet, a pump chamber inside the casing for communicating with the inlet and outlet, and a partition that closes, in a fluid-tight manner, a bottom portion of the pump chamber;

an impeller disposed inside the pump chamber so that it is rotatable about an axis of rotation and including an impeller shaft portion having a shaft hollow part and an impeller portion having an impeller hollow part extending radially and communicating with the shaft hollow part, the shaft hollow part and the impeller hollow part constituting a blood flow channel;

a magnetic supporter including an inside supporting permanent magnet attached to an outer periphery of the impeller shaft portion and an outside supporting permanent magnet attached to an inner periphery of the casing so that the inside and outside supporting permanent magnets repel each other and the impeller is rotatable supported within the casing in a direction normal to the axis of rotation;

a pivot bearing including a pivot provided at a bottom surface of the impeller portion through which the rotation axis passes and a pivot receptacle formed on the partition of the casing for rotatably supporting the impeller within the casing in a direction of the axis of rotation;

rotating means accommodated within the casing below the pump chamber for rotating the impeller; and

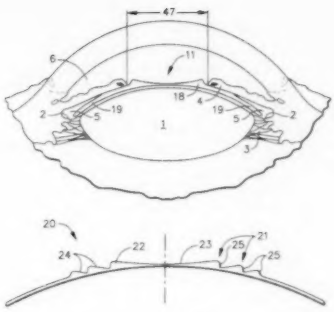
a magnetic coupler including a set of first coupling magnets attached to the bottom surface of the impeller portion and a set of second coupling magnets opposed to the set of first coupling magnets across the partition for transmitting rotating force of the rotating means to the impeller.

6,015,435

SELF-CENTERING PHAKIC INTRAOCULAR LENS

Igor Valunin, Cincinnati, and George W. Rozakis, North Olmsted, both of Ohio, assignors to International Vision, Inc., Cincinnati, Ohio

Provisional application No. 60/029,103, Oct. 24, 1996, Provisional application No. 60/029,341, Oct. 31, 1996. This application Oct. 22, 1997, Appl. No. 955,917.
Int. Cl.[7] A61F *2/16*
U.S. Cl. 623—6 **11 Claims**



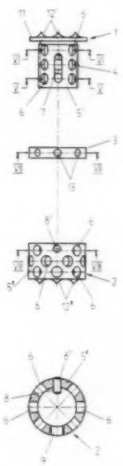
1. A phakic intraocular corrective lens having an anterior and a posterior side, comprising an optical body with is free of any openings between its anterior and posterior sides; a plurality of haptic bodies, said haptic bodies attached to and extending bilaterally from said optical body; an annular protruding surface of such size, shape and position that, when positioned in the eye, it will contact the iris at one or more points as the iris constricts to place a centering force on the lens, said protruding surface located on the anterior side of said lens; said lens configured such that when placed in the eye, the optical body is substantially in the posterior chamber of the eye behind the iris, and wherein the anterior side of the optical body is stepped forming up to three concentric rinds zones wherein the adjacent outer zones are displaced along the axis of the optical body relative to the adjacent inner zones to reduce the thickness of the optical body.

6,015,436

IMPLANT FOR FILLING A SPACE BETWEEN VERTEBRAE

Helmut Schönhöffer, Ulm, Germany, assignor to Heinrich Ulrich, Ulm/Donau, Germany

PCT No. PCT/DE97/01065, § 371 Date Apr. 17, 1998, § 102(e) Date Apr. 17, 1998, PCT Pub. No. WO97/47258, PCT Pub. Date Dec. 18, 1997
PCT Filed May 22, 1997, Appl. No. 11,418
Claims priority, application Germany, Jun. 7, 1996, 196 22 827
Int. Cl.[7] A61F *2/02;2/28;2/44*
U.S. Cl. 623—17 **6 Claims**



1. A spinal implant selectively insertable as a vertebral replacement and as an insert between vertebrae, said implant comprising:

an inner implant part having a tubular perforated sleeve and formed with a screw thread;

an outer implant part having a tubular perforated sleeve and receiving said sleeve of said inner implant part, said sleeve of said inner implant part being axially slidable in said sleeve of said outer implant part;

a center implant part braced on an end of said outer implant part and threadedly engaged with the screw thread on said sleeve of said inner implant part for altering a length of said implant, said parts and said screw thread being coaxial; and

means for preventing relative rotation of said inner and outer implant parts about a common axis of said sleeves.

6,015,437

SHOULDER PROSTHESIS

Clifford Alain Stossel, Kent, United Kingdom, assignor to Headcorn Instrumentation Ltd., Kent, United Kingdom

Filed Apr. 20, 1998, Appl. No. 62,739

Claims priority, application United Kingdom, Apr. 18, 1997, 9707853

Int. Cl.[7] **A61F** *2/40*

U.S. Cl. 623—19 **6 Claims**

1. A shoulder prosthesis comprising a shaft and, at a head of the shaft, a member having a surface that is hemispherical and extends continuously beyond a base of the hemisphere with a smaller radius to provide, in use, at least 210° of total rotation.

6,015,438

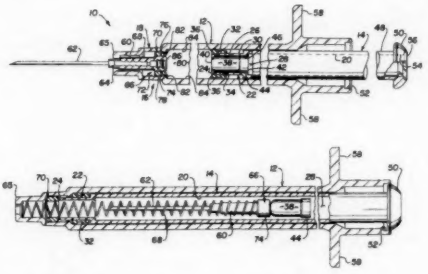
FULL DISPLACEMENT RETRACTABLE SYRINGE

Thomas J. Shaw, Little Elm, Tex., assignor to Retractable Technologies Inc., Little Elm, Tex.

Filed Nov. 14, 1997, Appl. No. 970,828

Int. Cl.[7] **A61M** *5/00*

U.S. Cl. 624—195 **19 Claims**



1. A full displacement syringe, comprising:

an elongated housing comprising a hollow barrel having a front end portion, and an inner surface;

a plunger configured to reciprocate in the barrel, the plunger having a retraction cavity within and a tubular nose in front with a leading wall having a removably sealed opening into the retraction cavity;

a retraction mechanism mounted in the front end portion of the barrel, the retraction mechanism comprising a needle and needle holder having a head, a biasing element tending to drive the needle holder rearwardly and a movable holding ring mounted on the head of the needle holder, said ring holding the retraction mechanism by contact with the inner surface of the barrel, wherein the retraction mechanism forms the bottom of a variable fluid chamber in the barrel;

a plunger seal forcibly slideably mounted near the front of the tubular nose of the plunger, said plunger seal being movable with the plunger in sliding contact with the inner surface of the barrel during fluid transfer operations;

a plunger seal restraint located on the barrel wall to restrain the plunger seal from forward movement after it has reached the bottom of the variable chamber without said restraint preventing the plunger nose from sliding forward through the plunger seal to operate the retraction mechanism;

whereby depression of the plunger to place the plunger seal at the bottom of the variable fluid chamber causes substantially full displacement of fluid from the barrel and further forward movement of the plunger causes the leading wall of the tubular nose of the plunger to operate the retraction mechanism by moving through the plunger seal to push the movable holding ring off the head of the needle holder, thereby initiating retraction.

6,015,439

DEEP BLACK DYE MIXTURES OF FIBER-REACTIVE AZO DYES AND A PROCESS FOR DYEING HYDROXY AND/OR CARBOXAMIDO CONTAINING FIBERS

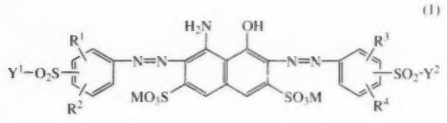
Ron Pedemonte, Eppstein-Vockenhausen, and Andreas Stroben, Odenthal, both of Germany, assignors to Dystar Textilefarben GmbH & Co., Frankfurt am Main, Germany

Filed Feb. 16, 1999, Appl. No. 249,756

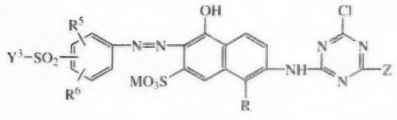
Int. Cl.[7] C09B *62/00*

U.S. Cl. 8—549 12 Claims

1. A dye mixture comprising one or more disazo dyes conforming to the general formula (1) and one or more monoazo dyes conforming to the general formula (2)



(1)



(2)

wherein:

R^1 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy;

R^2 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy;

R^3 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy;

R^4 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy;

R^5 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy;

R^6 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy;

Y^1 is vinyl, or is ethyl substituted in the β-position by a substituent which is eliminated by the action of an alkali, forming the vinyl group;

Y^2 has one of the meanings of Y^1;

Y^3 has one of the meanings of Y^1;

R is hydrogen or sulfo;

Z is cyanoamino, morpholino or a group of the general formula (20)

(20)

wherein

R^7 is hydrogen, alkyl of 1 to 4 carbon atoms, cyclohexyl, alkoxyalkyl of 3 to 6 carbon atoms, hydroalkyl of 2 to 4 carbon atoms or sulfoalkyl of 1 to 4 carbon atoms and

R^8 has one of the meanings given for R^7;

M is hydrogen or an alkali metal;

the dye, respectively dyes, of the general formula (1) being present in the mixture in an amount of from 50 to 95% by weight, and the dye, respectively dyes, of the general formula (2) being present in the dye mixture in an amount of from 5 to 50% by weight.

6,015,440

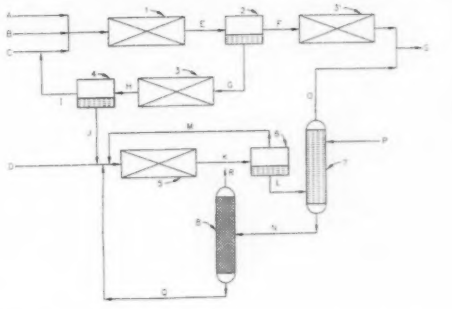
PROCESS FOR PRODUCING BIODIESEL FUEL WITH REDUCED VISCOSITY AND A CLOUD POINT BELOW THIRTY-TWO (32) DEGREES FAHRENHEIT

Hossein Noureddini, Lincoln, Nebr., assignor to Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Oct. 31, 1997, Appl. No. 961,939

Int. Cl.[7] C10L *1/18*

U.S. Cl. 44—388 12 Claims



4. An oxygenated biodiesel fuel, with a cloud-point below 32 degrees Fahrenheit, consisting of a mixture of transesterified triglycerides and a cloud-point reducing amount of etherified glycerol, said oxygenated biodiesel fuel being produced by a process comprising the steps of:

a. providing a quantity of triglycerides;

b. esterifying at least a portion of said triglycerides by mixing with a base and methyl alcohol to produce a mixture of esterified triglycerides and crude glycerol;

c. separating-out, in an essentially pure state, most of said esterified triglycerides from said mixture of esterified triglycerides and crude glycerol, thereby also providing separated-out substantially crude glycerol;

d. etherifying the crude glycerol provided in step c., by mixing isobutylene therewith; and

e. remixing at least a portion of the resulting glycerol ethers produced in step d., with at least a portion of the step c. separated out, essentially pure state esterified triglycerides to provide said biodiesel fuel with a cloud-point below 32 degrees Fahrenheit;

said steps a.–e. serving to produce said oxygenated biodiesel fuel with a cloud-point below 32 degrees Fahrenheit without other cloud-point reducing additive(s) and/or etherified glycerol from a source other than that identified in step d., being added thereinto;

said process optionally further comprising at least one additional step selected from the group consisting of:

f. after step d, and before step e., by treating said etherified glycerol with water, separating out unwanted double hydroxyl group containing ethers of glycerol produced in step d., prior to remixing the resulting mixture of glycerol ethers with at least a portion of the essentially pure state esterified triglycerides separated out in step c.; and

g. diverting a portion of the crude glycerol produced in the step b. esterification of said triglycerides and which is provided in step c., prior to performing the etherification of the crude glycerol provided in step d.

6,015,441

FUEL COMPOSITION

Gerald Ivan Brown, Wantage; Kevin John Morton, Chippenham, and Martin John Flannigan, Abingdon, all of United Kingdom, assignors to Exxon Chemical Patents, Inc., Linden, N.J.

PCT No. PCT/EP96/01728, § 371 Date Sep. 30, 1997, § 102(e) Date Sep. 30, 1997, PCT Pub. No. WO96/34073, PCT Pub. Date Oct. 31, 1996

PCT Filed Apr. 23, 1996, Appl. No. 930,399

Claims priority, application United Kingdom, Apr. 28, 1995, 9508644

Int. Cl.[7] **C10L** *1/18*

U.S. Cl. 44—393 **17 Claims**

1. A fuel composition meeting its CFPP specification and having a reduced tendency for aspiration comprising:

(A) a major proportion of a middle distillate petroleum fuel having a wax content of less than 2 wt % at 10° C. below the wax appearancee point of the fuel, and either

(i) a final boiling point of greater than 355° C. and either a (90–20%) distillation range of greater than 115° C. or a (FBP-90) distillation range of 30° C. or greater; or

(ii) a final boiling point of greater than 360° C., and either a (90–20%) distillation range of greater than 110° C. or a (FBP-90%) distillation range of 25° C. or greater; or

(iii) a final boiling point of greater than 370° C. and either a (90–20%) distillation range of greater than 100° C. or a (FBP-90%) distillation range of 25° C. or greater,

all temperatures being measured in accordance with ASTM D-86, and

(B) a minor proportion of an additive comprising

(B1) an ethylene-unsaturated ester copolymer flow improver wherein said ethylene-unsaturated ester copolymer comprises an ethylene copolymer having, in addition to units dervied from ethylene, units of the forumla:

$$—CR^5R^6—CHR^7—$$

wherein R^6 represents hydrogen or a methyl group; R^5 represents a —OCOCR[8] or —COOR[8] group wherein R^8 represents hydrogen or a C_5 or C_{28}, straight or branched chain alkyl group; and R^7 represents hydrogen or a —COOR[8] or —OCOR[8] group, the flow improver having an unsaturated ester content of 10 mole % or greater; and, optionally

(B2) an ethylene-unsaturated ester copolymer that is different from (B1).

6,015,442

ALUMINA-BASED ABRASIVE GRAINS AND METHOD FOR PREPARING SAME

Jean André Alary, Chedde, France, assignor to Pem Abrasifs Refractaires, Paris la Defense, France

PCT No. PCT/FR96/01609, § 371 Date Sep. 22, 1998, § 102(e) Date Sep. 22, 1998, PCT Pub. No. WO97/14759, PCT Pub. Date Apr. 24, 1997

PCT Filed Oct. 15, 1996, Appl. No. 51,642

Claims priority, application France, Oct. 16, 1995, 95 12316

Int. Cl.[7] **B24D** *3/04;3/28;* **C09K** *3/14*

U.S. Cl. 51—309 **8 Claims**

1. An alumina-based abrasive grain having a skin representing 0.1 to 5% by weight of the grain, which consists essentially of a mixture of finely dispersed aluminum hydrate for 5 to 95% of its weight and of sodium silicate for 5 to 95% of its weight.

6,015,443

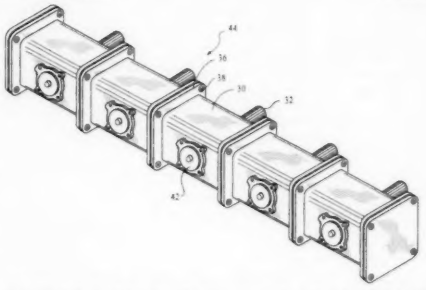
MODULAR PULSING HEADER FOR FABRIC FILTERS

Timothy P. Mallory, Sr., Southport, Fla., assignor to Merrick Environmental Technology Inc., Lynn Haven, Fla.

Filed Jun. 9, 1999, Appl. No. 328,823

Int. Cl.[7] **B01D** *46/04*

U.S. Cl. 55—302 **18 Claims**



1. A modular pulsing header apparatus for cleaning fabric filter bags comprising a pulsing header and at least one blow tube attachment protruding from a side of the pulsing header,

said pulsing header and blow tube attachment comprising a unitary, modular component defining a modular header;

said pulsing header comprising a port on a side of the pulsing header, said port being suitably adapted for mounting a pulsing valve onto the pulsing header such that the pulsing valve is in pneumatic communication with the blow tube attachment; and

wherein a plurality of said modular headers are capable of being connected to each other by a connecting means.

6,015,444

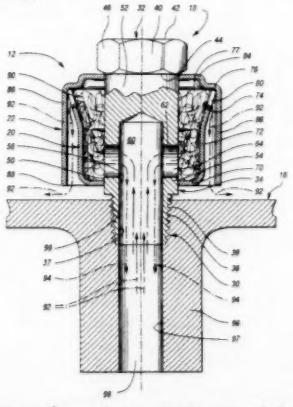
APPARATUS AND SYSTEM FOR VENTING A TRANSMISSION

Robert B. Craft, Ceresco; John S. Steurer, Kalamazoo, and Paul R. Peterson, Scotts, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 27, 1998, Appl. No. 32,802

Int. Cl.[7] **B01D** *46/00*

U.S. Cl. 55—320 **19 Claims**



1. An apparatus for venting a vehicular transmission containing a lubricating fluid, the apparatus comprising:

a standpipe having a first end, a second end and an intermediate portion extending axially between said first and second ends, said first end of said standpipe having a threaded region adapted for engagement with the transmission, the threaded region being of a size to resist formation of a film of the

lubricating fluid thereacross, said second end of said standpipe having at least one surface for transmitting torque to said standpipe, said intermediate portion having an axially extending passage and at least one radially extending passage;

a cylinder adapted to receive a filter, the cylinder having a first end secured to said standpipe and having at least one aperture;

a shroud secured to said standpipe; and

a filter disposed between said cylinder and said standpipe.

6,015,445

ANTI-CAKING SOLIDS

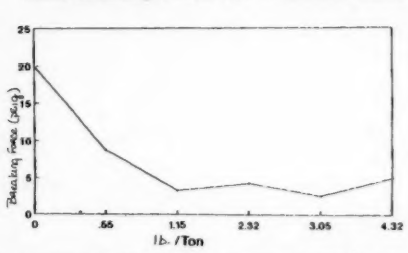
Andrew J. McNabb, and R. Merritt Sink, both of Lake Jackson, Tex., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Apr. 14, 1997, Appl. No. 837,198

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C05C** *9/00;7/00;* **C05B** *15/00;7/00*

U.S. Cl. 71—28 **20 Claims**



1. A process for hindering the tendency of solids to cake comprising the steps of:

(a) treating the solids with distillation heavies, which heavies are liquid at about 60° C. or less and are obtained from production of a ketone having the formula:

R=O,

wherein R is substituted or unsubstituted, branched, straight chain or cyclic, C_4 to C_{18}.

12. A substantially non-caking solid comprising:

an at least partially water soluble solid treated with distillation heavies, which heavies are liquid at about 60° C. or less and are obtained from production of a ketone having the formula:

R=O,

wherein R is substituted or unsubstituted branched, straight chain or cyclic C_4 to C_{18}.

6,015,446

PM HOT-WORK STEEL AND METHOD OF PRODUCING THE SAME

Maximilian Rochl, Munich, Germany, assignor to Hanspeter Hau, Baldham, Germany

PCT No. PCT/EP97/03119, § 371 Date Apr. 16, 1998, § 102(e) Date Apr. 16, 1998, PCT Pub. No. WO97/48829, PCT Pub. Date Dec. 24, 1997

PCT Filed Jun. 16, 1997, Appl. No. 11,792

Claims priority, application European Pat. Off., Jun. 17, 1996, 96109706

Int. Cl.[7] **C22C** *33/00*

U.S. Cl. 75—243 **6 Claims**

1. A powder-metallurgically produced hot-work steel consisting (in weight percent) of:

carbon: 0.25–4.45

chromium: 2.40–4.25

molybdenum: 2.50–4.40

vanadium: 0.20–0.95

cobalt 2.10–3.90

silicon: 0.10–0.80

manganese: 0.15–0.65

the balance being iron and possibly impurities resulting from production.

6,015,447

COBALT METAL AGGLOMERATES, A METHOD OF PRODUCING THEM AND THEIR USE

Astrid Görge; Juliane Meese-Marktscheffel, both of Goslar, Germany; Dirk Naumann, Ontario, Canada; Armin Olbrich, Seesen, and Frank Schrumpf, Goslar, both of Germany, assignors to H.C. Starck GmbH & Co. KG, Goslar, Germany

PCT No. PCT/EP96/02049, § 371 Date Nov. 21, 1997, § 102(e) Date Nov. 21, 1997, PCT Pub. No. WO96/37324, PCT Pub. Date Nov. 28, 1996

PCT Filed May 14, 1996, Appl. No. 952,551

Claims priority, application Germany, May 26, 1995, 195 19 331

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B22F** *9/00*

U.S. Cl. 75—255 **10 Claims**

1. Cobalt metal agglomerates consisting of peanut-shaped primary particles, wherein the primary particles have average particle sizes in the range from 0.1 to 0.7 μm.

6,015,448

PROCESS FOR PIG IRON DESULPHURIZATION

Heinz-Peter Kaiser, Neukirchen-Vluyn; Klaus-Jürgen Richter, Sonsbeck, and Niclas Müller, Ratingen, all of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Dec. 10, 1997, Appl. No. 988,280

Claims priority, application Germany, Dec. 18, 1996, 196 54 501

Int. Cl.[7] **C21B** *3/02*

U.S. Cl. 75—560 **10 Claims**

1. A process for desulphurization of a pig iron melt for further processing comprising: contacting the melt with a desulphurization reagent in ground form wherein the reagent is a slag accumulating in secondary steelmaking, the slag having a basicity of at least 4, an iron content in the range of 4 to 6 wt.-% and a phosphorous content in the range ≦0.4 wt.-%, or said slag accumulating in secondary steelmaking together with calcium carbide and magnesium as a solid mixture in ground form.

6,015,449

RAIN DROP DETECTING DEVICE

Koichi Hirota, Anjo; Kohki Ohara, Nishio, and Kazuyoshi Mori, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 12, 1998, Appl. No. 22,631

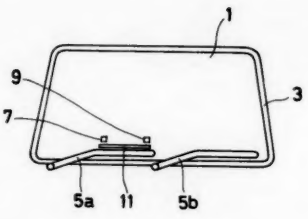
Int. Cl.[7] **G01N** *29/20;* **B06B** *3/02*

U.S. Cl. 75—599 **17 Claims**

1. A rain drop detecting device for detecting rain drops on a vehicle windshield, comprising:

an oscillation element disposed on a vehicle windshield for generating an ultrasonic wave on the windshield, the windshield having associated therewith a wiper which during non-operation is at a first location and which during operation moves across at least a portion of the windshield to remove rain drops;

an ultrasonic wave receiving element for receiving the ultrasonic wave generated by the oscillation element, the ultrasonic wave receiving element being disposed on the windshield in spaced apart relation to said oscillation element:



detecting means connected to the ultrasonic wave receiving element for detecting an amplitude of the ultrasonic wave received by the ultrasonic wave receiving element, with the amplitude of the ultrasonic wave received by the ultrasonic wave receiving element indicating a presence or absence of rain drops on the windshield; and

an absorbing member for absorbing a portion of the ultrasonic wave which is generated by the oscillation element, the absorbing member being disposed on the windshield between the oscillation element and said first location.

6,015,450

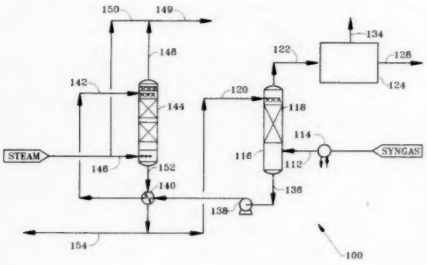
REDUCING METHANOL EMISSIONS FROM A SYNGAS UNIT

Girish Chimanlal Joshi, Sugar Land, and Stephen Allen Noe, Tomball, both of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Aug. 13, 1998, Appl. No. 133,477

Int. Cl.[7] B01D *53/14;53/047;19/00*

U.S. Cl. 95—139 **18 Claims**



1. A method for processing a raw synthesis gas stream to minimize methanol emissions, comprising the steps of:

(a) contacting the raw synthesis gas stream with condensate to form an overhead synthesis gas stream of reduced methanol content and a condensate stream enriched in methanol;

(b) steam stripping the methanol-enriched condensate stream to form a process steam stream enriched in methanol and a stripped condensate stream of reduced methanol content;

(c) recirculating a portion of the stripped condensate stream for the contacting step (a);

(d) treating the overhead gas stream in a purification unit to form a CO_2-rich stream essentially free of methanol and a synthesis gas stream of reduced CO_2 content.

6,015,451

VAPOR RECOVERY SYSTEM

Thomas B. Anderson, Hants, United Kingdom; Elliott Drucker, Irvine, Calif., and John Dennis Robinson, Berks, United Kingdom, assignors to Fluor Corporation, Irvine, Calif.

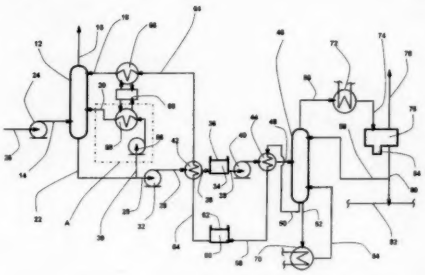
PCT No. PCT/GB97/01366, § 371 Date Apr. 13, 1998, § 102(e) Date Apr. 13, 1998, PCT Pub. No. WO96/41781, PCT Pub. Date Dec. 27, 1996

PCT Filed May 20, 1997, Appl. No. 983,289

Claims priority, application United Kingdom, May 20, 1996, 96303564

Int. Cl.[7] B01D *53/14*

U.S. Cl. 95—184 **38 Claims**



1. A method for recovering hydrocarbons from a mixture of hydrocarbon vapor and another gas, the mixture being supplied intermittently, comprising:

absorbing the hydrocarbon vapor with cooled petroleum distillate in an absorber (**12**);

transferring the resulting vapor-rich petroleum distillate to a buffer tank (**34**);

continuously pumping the vapor-rich petroleum distillate from the buffer tank to a distillation column (**46**);

continuously stripping at elevated pressure the vapor from the vapor-rich petroleum distillate in the distillation column (**46**);

continuously transferring the vapor-lean petroleum distillate from the distillation column (**46**) to a storage tank (**60**); and

transferring the vapor-lean petroleum distillate from the storage tank (**60**) to the absorber (**12**) for absorption of hydrocarbon vapor.

6,015,452

METHOD OF SERVICING AN AIR CLEANER AND OF FILTERING ENGINE INTAKE AIR USING PREFILTER ARRANGEMENTS

Larry R. Nepsund, Savage; Kathleen A. Abrahamson, Prior Lake; Thomas A. Boeckermann, Lakeville, and James K. Elfstrand, Mounds View, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of application No. 08/678,301, Jul. 11, 1996, Pat. No. 5,858,044. This application Jan. 7, 1999, Appl. No. 226,687.

Int. Cl.[7] B01D *46/00*

U.S. Cl. 95—287 **19 Claims**

1. A method of servicing an air cleaner of a vehicle having an engine size of at least 1.2 liters; said method including a step of:

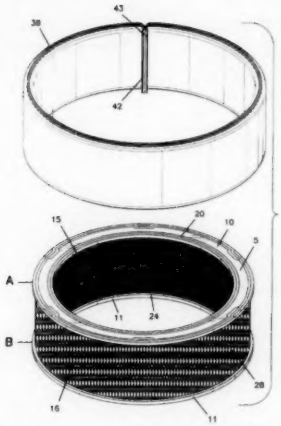
(a) installing, in the housing of an air cleaner of a vehicle having an engine size of at least 1.2 liters, a filter arrangement comprising:

(i) an inner air filter including:

(A) first and second end caps;

(B) an outer liner extending between the first and second end caps; said outer liner having a first open surface area;

(C) a cylindrical extension of pleated filter media circumscribed by said outer liner and extending between said first and second end caps;



(D) said inner filter being circular and having: an inside diameter within the range of 4 inches to 14 inches; and, an outside diameter within the range of 5 inches to 25 inches; and,

(ii) a removable and replaceable prefilter circumscribing said inner filter and covering at least 90% of said first open surface area of said outer liner;

(A) said removable and replaceable prefilter comprising a ring construction of filter material including at least first and second layers of filter media secured together;

(1) said first layer generally circumscribing said second layer;

(2) said first layer comprising nonwoven fibrous depth media having an average fiber diameter of no greater than 40 microns; and

(3) said second layer comprising a layer of foam media including an open cell foam having a cell density of 30 to 80 pores per inch.

6,015,453

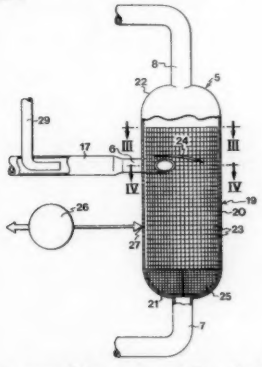
REFRIGERATION SYSTEM AND A SEPARATOR THEREFOR

Ketil Haugen, Rydebäck; Håkan Ohlsson, Furulund, and Per-Oskar Persson, Helsingborg, all of Sweden, assignors to Frigoscandia Equipment AB, Helsingborg, Sweden

Division of application No. 08/811,025, Mar. 4, 1997, Pat. No. 5,857,347. This application Nov. 2, 1998, Appl. No. 184,084.

Int. Cl.[7] **F25B** *43/00;* **B01D** *19/00*

U.S. Cl. 96—195 **7 Claims**



1. A separator comprising a substantially cylindrical container having top and bottom outlets and an inlet thereinbetween for separating the vapor and liquid components of a refrigerant received from an evaporator in a refrigeration system, to said top and bottom outlets, respectively, said inlet being directed tangentially into the cylindrical container,

wherein a foraminous, substantially cylindrical partition having a smaller width than the container, is positioned inside the container and extends downwardly of said inlet and inwardly of the inner surface of said container for delimiting a central space and a peripheral space of the container from each other;

and wherein said inlet discharges into the central space.

6,015,454

PROCESS FOR PRINTING TEXTILE FIBRE MATERIALS IN ACCORDANCE WITH THE INK-JET PRINTING PROCESS

Roger Lacroix, Village-Neuf; Mickael Mheidle, Sausheim, both of France, and Peter Scheibli, Bottmingen, Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Jun. 2, 1998, Appl. No. 89,146

Claims priority, application Switzerland, Jun. 17, 1997, 1473/97

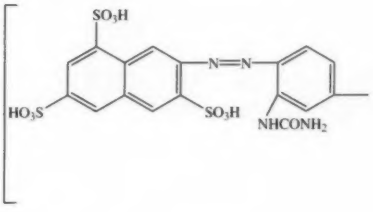
Int. Cl.[7] **C09D** *11/02*

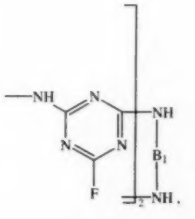
U.S. Cl. 106—31.47 **14 Claims**

1. A process for printing textile fibre materials in accordance with the ink-jet printing process, wherein the fibre materials are printed with an aqueous ink comprising

a) at least one reactive dye of formulae

(1a)





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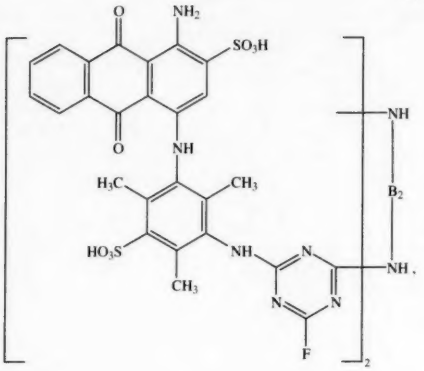
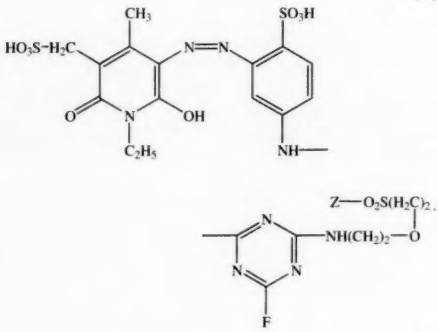
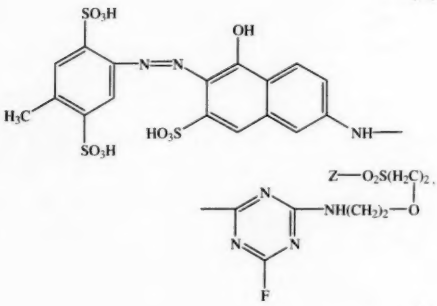
(1b)



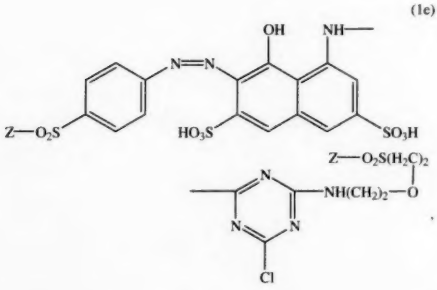
(1c)



(1d)



(1e)



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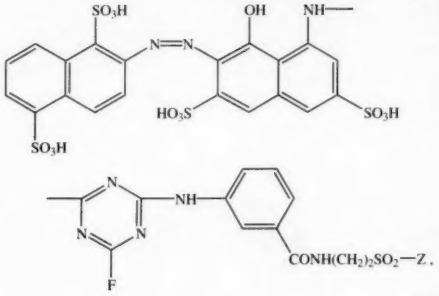
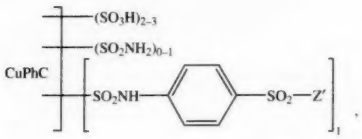
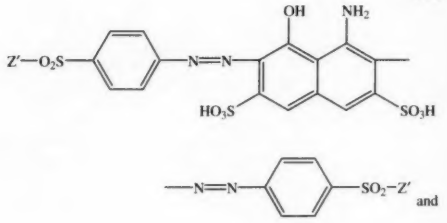
(1f)



(1g)

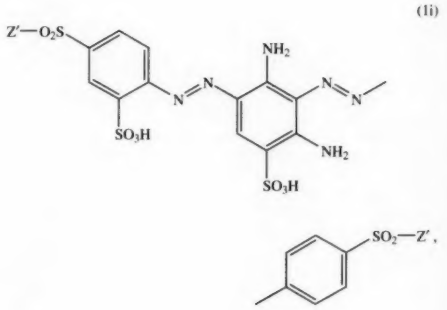


(1h)



and

(1i)



wherein

Z and Z' are each independently of the other vinyl or a radical of the formula $—CH_2—CH_2OSO_3H$,

B_1 and B_2 are each a C_2–C_{12}alkylene radical which may be interrupted by 1, 2 or 3 —O— members and is unsubstituted or substituted by hydroxy, sulfo, sulfato, oyano or by carboxy and

CuPhC is a copper phthalocyanine radical, and

b) 1,2-propylene glycol or N-methyl-2-pyrrolidone with the proviso that said ink does not contain any substantial amount of a compound of the formula $S(CH_2CH_2OH)_2$.

6,015,455
INK JET RECORDING INK AND INK JET RECORDING METHOD

Toshiyuki Yano; Hitoshi Kojima; Eisuke Hiraoka; Akihiko Chujo; Kaoru Watanabe; Hiromi Nagai; Yasuharu Endo, and Ken Hashimoto, all of Minami-Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1997, Appl. No. 909,771

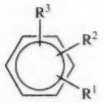
Claims priority, application Japan, Aug. 21, 1996, 8-219998

Int. Cl.[7] C09D *11/02*

U.S. Cl. 106—31.58 **20 Claims**

1. An ink jet recording ink comprising water, a water-soluble organic solvent, at least one dye having at least one carboxyl group in the form of a free acid, a substituted aromatic compound represented by general formula (I) and at least one compound selected from alkali metal hydroxides, wherein the pH value thereof is from 8 to 12:

(I)



wherein, R^1 is a functional group selected from the group consisting of a carboxyl group, a sulfonic group, a salt of a carboxyl group, and a salt of a sulfonic group, R^2 is a functional group selected from the group consisting of hydrogen, a hydroxyl group, an amino group, a nitro group, a methyl group, an ethyl group, a carboxyl group, a sulfonic group, a salt of a carboxyl group, and a salt of a sulfonic group, and R^3 is a functional group selected from the group consisting of a hydrogen, a hydroxyl group, an amino group, a nitro group, a methyl group, and an ethyl group.

6,015,456
ALUMINA PARTICLES HAVING HIGH DISPERSIBILITY AND PLASTICITY

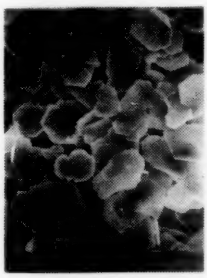
Takeshi Fukuda, and Ryuichi Shido, both of Kurobe, Japan, assignors to YKK Corporation, Tokyo, Japan

Filed Aug. 23, 1996, Appl. No. 697,470

Claims priority, application Japan, Aug. 24, 1995, 7-237882; Nov. 17, 1995, 7-322411

Int. Cl.[7] C09D *1/00*

U.S. Cl. 106—286.5 **3 Claims**



1. Alumina particles in the form of hexagonal plate crystals having a single crystal structure of α-alumina and having a particle size of 0.2 to 15 μm and an aspect ratio of 15 to 50, wherein phosphoric acid or phosphate is present at least on the surface of the particles.

6,015,457
STABLE INORGANIC POLYMERS

Roger Y. Leung, and Tadashi Nakano, both of San Jose, Calif., assignors to AlliedSignal Inc., Morristown, N.J.

Provisional application No. 60/044,478, Apr. 21, 1997. This application Mar. 12, 1998, Appl. No. 39,289.

Int. Cl.[7] C08G *77/04*

U.S. Cl. 106—287.16 **8 Claims**

1. A solution for coating a semiconductor device comprising:

a poly (hydrido siloxane) copolymer having a general formula:

$$(HSiO_{1.5})_a(HSiO(OR))_b(SiO_2)_c,$$

wherein R is a mixture of H and an alkyl group having between 1 and 4 carbon atoms; a+b+c=1; 0.5< a<0.99; 0.01<b<0.5; and 0<c<0.5; and

a solvent selected from the group consisting of dialkylketals, alkylacetates, dialkylacetals, ethers, dialkyl glycol ethers, ketones, and esters, or mixtures thereof,

wherein said solution for coating a semiconductor has a water content of less than about 0.5% by weight and an alcohol content of less than about 1% by weight.

6,015,458
PROCESS FOR THE PREPARATION OF HIGHLY CHROMATIC PERYLENE PIGMENTS

Gregory R. Schulz, and Michael J. Greene, both of Mt. Pleasant, S.C., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1998, Appl. No. 211,349

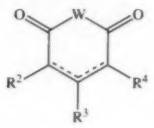
Int. Cl.[7] C07D *221/00;309/00;* **C09B** *3/14;3/18*

U.S. Cl. 106—498 **12 Claims**

1. A process for preparing a perylene pigment composition comprising reacting

(a) a perylene tetracarboxylic compound;

(b) about 0.01 to about 20% by weight, relative to the perylene tetracarboxylic compound, of a non-pigmentary cyclic anhydride or imide having the formula



wherein

W is O or NR^1,

R^1 is hydrogen, a metal, C_1–C_6 alkyl, C_5–C_8 cycloalkyl, C_7–C_{16} aralkyl, C_6–C_{10} aryl, or -Alk-X,

R^2, R^3, and R^4 are independently hydrogen, C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl, or R^2 and R^3 together are fused-on rings and R^4 is hydrogen, C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl, or R^2, R^3, and R^4 together are fused-on rings,

the dotted line is an optional double bond representing R^2—C═C—R^3 or R^3—C═C—R^4,

Alk is C_1–C_{18} alkylene or C_5–C_8 cycloalkylene, and

X is

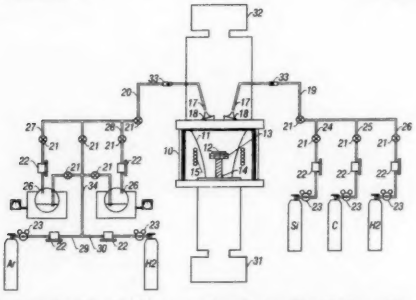
(i) an anionic group selected from $—SO_3^-$, $—COO^-$, $—PO_3^{=}$, $—PO(OR^x)O^-$ (wherein R^x is C_1–C_6 alkyl), $—O—PO_3^{=}$, or $—O—PO(OR^y)O^-$ (wherein R^y is C_1–C_6 alkyl), wherein the anionic group is electrically balanced with a stoichiometric amount of a cation,

(ii) a cationic group having the formula $—NR^aR^bR^{c+}$ (wherein R^a, R^b, and R^c, are independently hydrogen, C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl), wherein the cationic group is electrically balanced with a stoichiometric amount of an anion,

(iii) NR^dR^e, wherein R^d is hydrogen, C_1–C_6 alkyl, C_7–C_{16} aralkyl, C_6–C_{10} aryl, C_2–C_6 alkanoyl, C_7–C_{11} aroyl, or sulfonyl and R^e is hydrogen, C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl,

(iv) OR^f, wherein R^f is hydrogen, C_1–C_6 alkyl, or C_6–C_{10} aryl,
(v) $COOR^g$, wherein R^g is C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl,
(vi) sulfonyl, or
(vii) C_6–C_{10} aryl;
(c) an equivalent excess, relative to the total amount of components (a) and (b), of ammonia or a primary amine having the formula R^A-NH_2 wherein R^A is C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl;
(d) optionally, a solvent; and
(e) optionally, one or more additives.

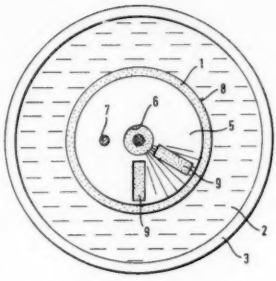
6,015,459
METHOD FOR DOPING SEMICONDUCTOR MATERIALS
Keith D. Jamison, and Mike L. Kempel, both of Austin, Tex., assignors to Extreme Devices, Inc., Austin, Tex.
Filed Jun. 26, 1998, Appl. No. 105,420
Int. Cl.[7] C30B *33/06*
U.S. Cl. 117—2 **12 Claims**



1. A method for doping a semiconductor film during epitaxial growth by chemical vapor deposition or sublimation, comprising the steps of:
providing a substrate at a selected temperature in a growth chamber having selected pressure conditions suitable for epitaxial growth;
introducing a plurality of growth precursor materials into the growth chamber;
introducing through a nozzle a supersonic beam comprising a carrier gas and a dopant gas into the growth chamber and impinging the supersonic beam onto the substrate at a first selected energy, the distance from the nozzle to the substrate and the pressure conditions in the growth chamber being selected so as to maintain supersonic flow conditions therebetween; and
allowing growth to continue until a film having a selected dopant concentration and of selected thickness is formed.

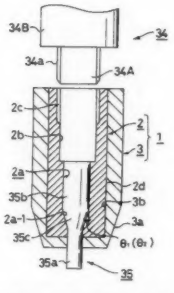
6,015,460
METHOD AND APPARATUS FOR PULLING A MONOCRYSTAL
Erich Dornberger, and Wilfried Von Ammon, both of Burghausen, Germany, assignors to Wacker Siltronic Gesellschaft fur Halbleitermaterialien AG, Burghausen, Germany
Division of application No. 08/744,544, Nov. 6, 1996, Pat. No. 5,759,261. This application Mar. 13, 1998, Appl. No. 39,068.
Claims priority, application Germany, Dec. 15, 1995, 195 46 987
Int. Cl.[7] C30B *35/00*
U.S. Cl. 117—217 **8 Claims**

1. An apparatus for pulling a silicon monocrystal from a melt, said monocrystal having a conical portion at a beginning of said monocrystal, comprising



a shielding means which is spaced apart from the monocrystal and which shields a surface of the conical portion at the beginning of the monocrystal, said shielding means being provided with a central opening and with at least one cutout through which the surface of the conical portion at the beginning of the monocrystal is observable.

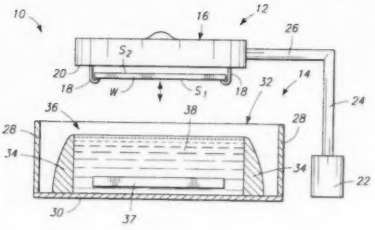
6,015,461
SEED CRYSTAL HOLDERS, FOR PULLING A SINGLE CRYSTAL
Teruo Izumi, Hyogo pref., Japan, assignor to Sumitomo Sitix Corporation, Amagasaki City, Japan
Filed Sep. 15, 1997, Appl. No. 929,118
Int. Cl.[7] C30B *35/00*
U.S. Cl. 117—218 **10 Claims**



1. A seed crystal holder, comprising an inner cylindrical body made of metal which directly holds a seed crystal, and a carbon cylindrical body arranged around the inner cylindrical body to cover the periphery of the inner cylindrical body.

6,015,462
SEMICONDUCTOR PROCESSING WORKPIECE POSITION SENSING
James W. Doolittle, Kalispell, Mont., assignor to Semitool, Inc., Kalispell, Mont.
Filed Sep. 30, 1997, Appl. No. 940,523
Int. Cl.[7] B05C *11/00*
U.S. Cl. 118—668 **19 Claims**

11. In a semiconductor workpiece processor including a process module having a process container having a process fluid therein and a workpiece holder configured to hold a semiconductor workpiece relative to the process fluid, a drive motor configured to adjust the position of the semiconductor relative to the process fluid, and a position sensor configured to monitor the position of the semiconductor workpiece relative to the process fluid, the position sensor comprises:
a voltage reference electrically coupled with the process module and configured to apply a reference signal thereto;



a comparator configured to output an indication signal responsive to receiving the reference signal from the process module corresponding to the position of the semiconductor workpiece relative to the process fluid; and

a latch configured to store the indication signal.

6,015,463

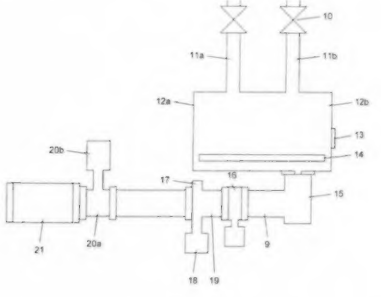
METHOD AND SYSTEM FOR TRAPPING CONTAMINANTS FORMED DURING CHEMICAL VAPOR DEPOSITION PROCESSING OF SEMICONDUCTOR WAFERS

Arthur Leo Cox, Buda, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 14, 1997, Appl. No. 801,081

Int. Cl.[7] **C23C** *16/00*

U.S. Cl. 118—715 **20 Claims**



1. A system for performing a chemical vapor deposition, comprising:

a reactor chamber comprising:

a wafer holder disposed within the reactor chamber;

an inlet opening for accepting a gas into the reactor chamber;

a loading opening for loading wafers into the reactor chamber; and

an outlet opening for expelling the gas from the reactor chamber;

an inlet conduit communicating with the inlet opening, thereby allowing the gas to enter the reactor chamber;

an outlet conduit communicating with the outlet opening, thereby allowing the gas to exit the reactor chamber;

a valve disposed within the outlet conduit for controlling movement of the gas through the outlet conduit; and

a particle trap disposed within the outlet conduit between the valve and the reactor chamber, the particle trap comprising an empty valve body that includes a reservoir for collecting particles.

6,015,464

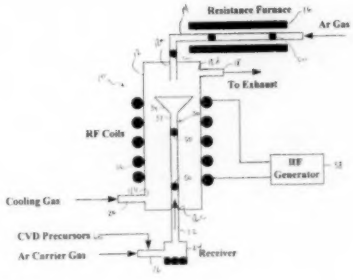
FILM GROWTH SYSTEM AND METHOD FOR SPHERICAL-SHAPED SEMICONDUCTOR INTEGRATED CIRCUITS

Changfeng Xia, and Yanwei Zhang, both of Plano, Tex., assignors to Ball Semiconductor, Inc., Allen, Tex.

Filed Apr. 29, 1998, Appl. No. 69,647

Int. Cl.[7] **C23C** *16/00*

U.S. Cl. 118—715 **18 Claims**



1. An apparatus for processing a semiconductor device, the apparatus comprising:

a first enclosure containing a plurality of apertures and a conductor coil;

a second enclosure coaxial with the conductor coil for defining a chamber;

a voltage generator electrically connected to the conductor coil;

a first conduit registering with an aperture of the first enclosure for supplying the semiconductor device;

a first inlet registering with the chamber for receiving the semiconductor device from the first conduit;

a preheater furnace proximate to the first enclosure for preheating the semiconductor device to a first temperature, before the semiconductor device is received by the first inlet; and

a second inlet registering with the chamber for receiving at least one chemical precursor for processing the semiconductor device;

wherein the voltage generator supplies a voltage differential to the conductor coil, thereby heating the device to a second temperature as it moves past the first inlet, and

wherein the semiconductor device is processed inside the chamber without contacting either the first or second enclosure.

6,015,465

TEMPERATURE CONTROL SYSTEM FOR SEMICONDUCTOR PROCESS CHAMBER

Arnold Kholodenko, San Francisco; Ke Ling Lee, Cupertino; Maya Shendon, San Carlos, and Efrain Quiles, San Lorenzo, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

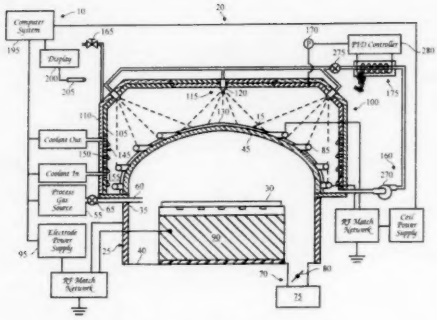
Filed Apr. 8, 1998, Appl. No. 57,097

Int. Cl.[7] **B05C** *11/00;* **C23C** *16/00*

U.S. Cl. 118—719 **13 Claims**

1. An apparatus capable of processing a substrate, the apparatus comprising:

(a) a process chamber having an external surface, the chamber comprising a support capable of holding the substrate in the chamber, a gas distributor capable of distributing process gas in the chamber, a plasma generator capable of forming a plasma from the process gas capable of processing the substrate, and an exhaust capable of exhausting spent process gas from the chamber; and



(b) a vapor chamber surrounding the external surface of the process chamber, the vapor chamber comprising a fluid distributor adapted to apply a fluid film over the external surface of the process chamber to control the temperature of the external surface.

6,015,466

MICROCRYSTALLINE SUGARS OR SUGAR-ALCOHOLS; METHOD FOR PREPARING THE SAME

Jean-Paul Maitre, Marennes; Julio Mentech, Lyons; Sylvie Reynaud, Villeurbanne, and Emile Wong, Neyron, all of France, assignors to Eridania Beghin-Say, Thumeries, France

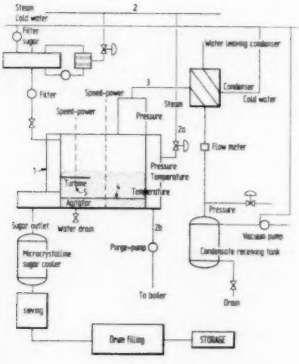
PCT No. PCT/FR96/01931, § 371 Date Jul. 21, 1998, § 102(e) Date Jul. 21, 1998, PCT Pub. No. WO97/21838, PCT Pub. Date Jun. 19, 1997

PCT Filed Dec. 4, 1996, Appl. No. 77,748

Claims priority, application France, Dec. 11, 1995, 95 14643

Int. Cl.[7] C13F *1/02;3/00;1/10*

U.S. Cl. 127—30 **12 Claims**



1. A composition containing sugar microcrystals, wherein the crystals are essentially unbroken monocrystals with a regular geometric shape, homogeneous with respect to one another, and

the particle size follows a Gaussian distribution whose median is about 20 μm to about 220 μm, the coefficient of variation being about 20% to about 50%; or

the particle size distribution has a uniformity index between 1 and 5.

6,015,467

METHOD OF REMOVING COATING FROM EDGE OF SUBSTRATE

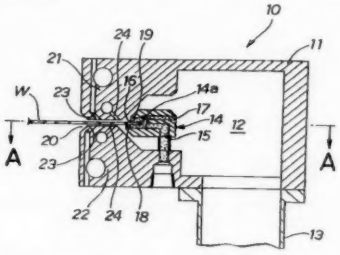
Koichi Nagasawa; Naomi Kawaguchi; Futoshi Shimai, all of Kanagawa, Japan; Mitsuru Sato, Hillsboro, Oreg.; Kouji Harada, and Jun Koshiyama, both of Kanagawa, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Continuation-in-part of application No. 08/857,485, May 16, 1997, and application No. 08/788,442, Jan. 28, 1997, Pat. No. 5,849,467, and application No. 08/612,723, Mar. 8, 1996, Pat. No. 5,688,411. This application May 21, 1997, Appl. No. 859,926.

Claims priority, application Japan, May 21, 1996, 8-125970

Int. Cl.[7] B08B *1/02;3/08;3/12*

U.S. Cl. 134—1 **22 Claims**



1. A method of removing a coating from an edge of a substrate, comprising the steps of:

filling a solvent reservoir with a solvent to dissolve and remove a photoresist film, the solvent consisting essentially of one of dipropylene glycol monoalkyl ether alone, a mixture of said ether and a volatile organic solvent having a boiling point of 75–130° C., vapor pressure of 5–75 mm Hg at 20° C., and an alkaline aqueous solution formed by dissolving in water 0.05–20% by weight aqueous organic solvent and 0.05–20% by weight alkali, in advance;

horizontally inserting an edge of a substrate into said reservoir; and

thereafter, immersing said edge of said substrate in said solvent for a period of time to dissolve and remove the coating from said edge of said substrate.

6,015,468

PROCESS FOR TREATING VULCANIZED TREAD RUBBER SURFACES BEFORE BONDING

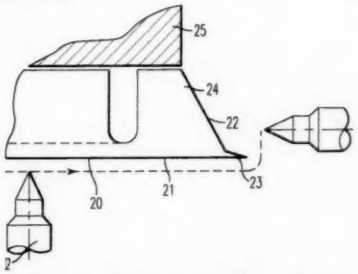
Jean-Marie Courel, Culhat; Denis Schruoffeneger, Chatel-Guyon, and Serge Solignac, Ceyrat, all of France, assignors to Compagnie Generale des Etablissements Michelin - Michelin & CIE, Clermont-Ferrand Cedex, France

Division of application No. 08/359,525, Dec. 20, 1994, Pat. No. 5,759,322. This application Oct. 6, 1997, Appl. No. 943,225.

Claims priority, application France, Dec. 20, 1993, 93 15408

Int. Cl.[7] B29C *35/02*

U.S. Cl. 156—129 **4 Claims**



1. In a process for producing a premolded and prevulcanized tread in a vulcanizing mold, wherein, at the outlet of the vulcaniz-

ing mold, the surface of a sole of said tread is treated by applying a high-pressure jet consisting of water to said surface to create surface roughness for subsequent bonding of the tread to a casing.

6,015,469

PROCESS FOR THE PRODUCTION OF A SUPPORT FOR SUBLIMABLE COLOR TRANSFER FOR DECORATING ITEMS OR ARTIFACTS FROM METAL, PLASTIC MATERIALS AND THE LIKE

Giancarlo Fenzi, Cazzano di Tramigna, Italy, assignor to V.I.V. International S.P.A., Cazzano di Tramigna, Italy

Filed Feb. 4, 1998, Appl. No. 18,586

Claims priority, application Italy, Feb. 6, 1997, MI97A0231

Int. Cl.[7] B44C *1/165;* **B32B** *31/00;* **B41M** *3/12*

U.S. Cl. 156—230 **5 Claims**

1. A process for the production of a flexible transfer support for sublimable color transfer to be used to realize a decoration on the surface of various items from metal, or plastic materials, such as metal sections from light alloys, rolled sections, artifacts for town fixtures through the transfer technique, which process, comprises the following steps:

preparing an engraved metal matrix carrying an impression equal to said decoration;

applying said decoration realized with sublimable inks on a sheet or a strip from flexible non-extensible material, by means of said engraved metal matrix carrying said impression equal to said decoration;

transferring said decoration from said flexible non-extensible sheet or strip to a sheet or strip from flexible material, selected from the group consisting of fabric or non-woven fabric, by heat compression of said flexible non-extensible sheet or strip against said sheet or strip from flexible material, obtaining a flexible transfer support carrying said sublimable color decoration.

6,015,470

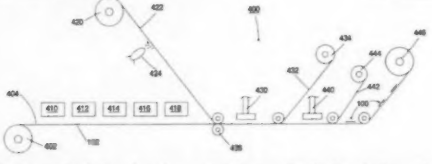
HANGER LABEL

Carl W. Treleaven, Greensboro, N.C., and Glenn A. Grosskopf, Lake Zurich, Ill., assignors to Pharmagraphics (Midwest), L.L.C., Itasca, Ill., and Pharmagraphics (Southeast), L.L.C., Greensboro, N.C.

Division of application No. 08/647,466, May 3, 1996, Pat. No. 5,738,381, which is a continuation-in-part of application No. 08/533,082, Sep. 25, 1995, abandoned. This application Jan. 28, 1998, Appl. No. 14,784.

Int. Cl.[7] B32B *31/00*

U.S. Cl. 156—267 **37 Claims**



1. A method for forming a label for displaying information regarding a container and suspending the container from a support, said method comprising the steps of:

a) providing a base web having an upper surface, a lower surface, and a base adhesive coating the lower surface thereof;

b) selectively applying a release varnish to the upper surface of the base web;

c) marrying a top web having a lower surface and an adhesive strip coating a portion of the lower surface of the top web to the base web such that the adhesive strip engages the varnish on the upper surface of the base web;

d) cutting the top web down to the base web to form a hanger therein; and

e) cutting through the base web to form a base label therein.

6,015,471

INFLATABLE CUSHIONS

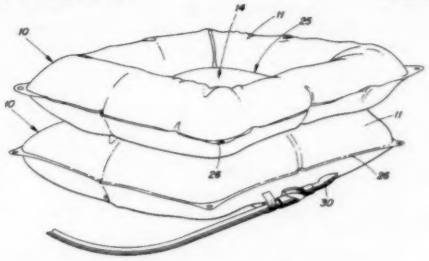
Richard Michael Rimington, Powys, and Richard Edmond Fletcher, Leominster, both of United Kingdom, assignors to Manger International Limited, United Kingdom

Filed Apr. 30, 1998, Appl. No. 70,835

Claims priority, application United Kingdom, May 15, 1997, 9709843

Int. Cl.[7] B29L *22/02;* **B32B** *31/24*

U.S. Cl. 156—274.4 **6 Claims**



1. An inflatable lifting cushion comprising:

(a) plurality of inflatable segments including a first segment superimposed on a second segment, wherein each segment comprises a ring chamber (**11**) around a central web (**12**),

(b) segments are bonded together at a junction between the ring chambers so that a central chamber (**14**) is formed between the central webs (**12**);

(c) all said chambers are pneumatically interconnected and

(d) an inlet (**30**) is attached to the cushion for inflating said chambers in unison.

6,015,472

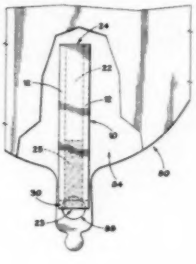
METHOD OF PRODUCING A BALLOON WITH A SELF-SEALING VALVE

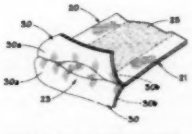
Arturo Verduzco Garcia, Jalisco, Mexico, assignor to Convertidora Industrial S.A. DE C.V., Guadalajara, Mexico

Division of application No. 08/564,486, Nov. 29, 1995, Pat. No. 5,860,441. This application Aug. 7, 1998, Appl. No. 130,935.

Int. Cl.[7] A63H *27/10*

U.S. Cl. 156—290 **7 Claims**





1. A method of producing a balloon with a self-sealing valve having a curling inlet, comprising the steps of:

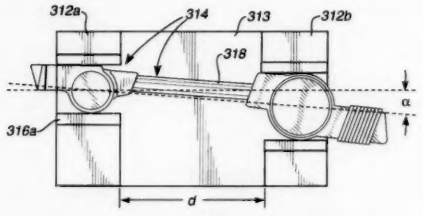
(a) laminating a first ribbon to a second ribbon under conditions to differentially stress the two ribbons to produce a laminate and curl the laminate;

(b) providing first and second plastic valve sheets having corresponding inlet and outlet ends and corresponding side edges;
(c) securing said laminate to said first plastic valve sheet at the inlet end of said first plastic valve sheet;
(d) securing said first plastic valve sheet to said second plastic valve sheet to define a valve having a valve passageway, a valve inlet at said inlet ends, and a valve outlet;
(e) providing two balloon sheets, one of which has a balloon opening;
(f) securing said valve to a first said balloon sheet with the valve inlet at a position corresponding to said balloon opening; and
(g) securing said first balloon sheet to a second balloon sheet to define a balloon, and wherein said valve inlet is visible in said balloon opening.

6,015,473
METHOD FOR PRODUCING A PRECISION 3-D MEASURING APPARATUS

Louis B. Rosenberg, Pleasanton; Bruce M. Schena, Menlo Park; Scott B. Brave, Stanford, and Bernard G. Jackson, Atherton, all of Calif., assignors to Immersion Corporation, San Jose, Calif.

Division of application No. 08/512,084, Aug. 7, 1995, Pat. No. 5,724,264. This application Nov. 1, 1996, Appl. No. 744,725.
Int. Cl.[7] B29C *65/00;65/54;65/78*
U.S. Cl. 156—293 **14 Claims**



1. A method for assembling a linkage assembly of a probe apparatus for measuring three-dimensional coordinates and for calibrating the probe apparatus, the linkage assembly including a plurality of rotatable joint members and a linkage, the method comprising:

providing two joint fixtures positioned a precise distance apart and having a precise predetermined orientation with respect to each other, each of said fixtures for receiving and holding one of said rotatable joint members of said linkage assembly;

loosely connecting a portion of each of said rotatable joint members to an associated end of a linkage so that said portions of said joint members can each be moved along said linkage to different positions at said end of said linkage;

moving said loosely connected portion of said rotatable joint member along said linkage to one of said positions to provide a distance between said portions of said joint members that allows each of said joint members to fit in a respective joint fixture;

placing and holding each of said joint members of said linkage assembly in an associated one of said joint fixtures such that said linkage has a precise desired length between said portions of said joint members;

bonding said portions of said joint members to said linkage while said joint members are held in said joint fixtures, thereby providing joints at both ends of said linkage at a precise distance apart from each other; including said linkage assembly in said probe apparatus; and

calibrating said probe apparatus which includes said joint linkage assembly and a probe, wherein said calibrating includes positioning said probe at an arbitrary location within a selected volume, sampling a plurality of orientations of said probe at said arbitrary location, and determining calibration parameters based on error values determined between said sampled orientations, wherein said calibration parameters are used when determining a position and orientation of said probe during use of the probe apparatus.

6,015,474
METHODS OF USING PRIMER MOLECULES FOR ENHANCING THE MECHANICAL PERFORMANCE OF TISSUE ADHESIVES AND SEALANTS

Erwin R. Stedronsky, San Clemente, Calif., assignor to Protein Polymer Technologies, San Diego, Calif.

Filed Jun. 20, 1997, Appl. No. 879,564
Int. Cl.[7] C09J *5/04*
U.S. Cl. 156—314 **30 Claims**

1. A method of maintaining separated tissue in proximate relationship, said method comprising:

applying to said separated tissue (a) a primer molecule, wherein said primer molecule is urea, a suiphonated aromatic compound, a protein or an oglioreptide and (b) a tissue adhesive comprising a natural or recombinantly-produced protein, said primer molecule being capable of physically interacting with collagen present in said separated tissue and thereby rendering said separated tissue capable of forming a bonded interface with said tissue adhesive, wherein (a) and (b) are applied in an amount effective to maintain said separated tissue in proximate relationship when said separated tissue is brought into proximate relationship.

6,015,475
POLYURETHANE SEALANT COMPOSITIONS

Harry W. Hsieh, Troy, and Syed Z. Mahdi, Rochester Hills, both of Mich., assignors to Essex Specialty Products, Inc., Auburn Hills, Mich.

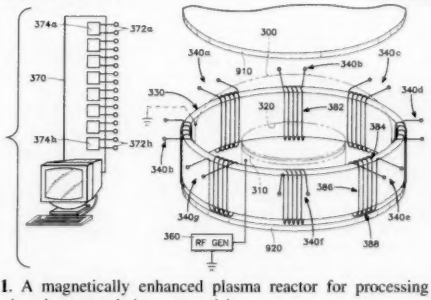
Division of application No. 08/790,635, Jan. 29, 1997, Pat. No. 5,852,137. This application Aug. 6, 1998, Appl. No. 129,856.
Int. Cl.[7] C09J *4/00*
U.S. Cl. 156—331.4 **17 Claims**

1. A sealant composition comprising (1) a urethane prepolymer having an isocyanate functionality of at least about 2.0 and a weight average molecular weight of at least about 2,000; and (2) a catalytic amount of a substantially active hydrogen free glycol acid salt of a tertiary amine and an organo metallic compound.

6,015,476
PLASMA REACTOR MAGNET WITH INDEPENDENTLY CONTROLLABLE PARALLEL AXIAL CURRENT-CARRYING ELEMENTS

Ross D. Schlueter, Berkeley, and Steve Marks, Moraga, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Feb. 5, 1998, Appl. No. 19,522
Int. Cl.[7] C23F *1/02*
U.S. Cl. 156—345 **83 Claims**



1. A magnetically enhanced plasma reactor for processing a semiconductor workpiece, comprising:

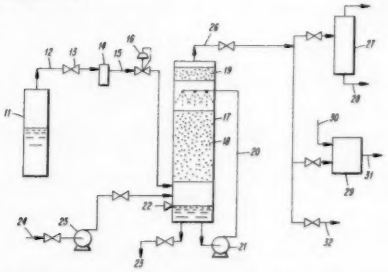
a reactor enclosure defining a vacuum chamber;
a wafer support for holding said workpiece inside said chamber;
a plasma power source for applying plasma source power into said chamber;
a first plurality of electrically conductive elongate filaments, each being of a finite length, distributed about a periphery of said chamber enclosure, each of said filaments extending at least generally in an axial direction relative to said chamber; and
said plurality of filaments being capable of permitting different currents through different ones of at least some of said filaments in accordance with a distribution of currents among said filaments corresponding to a desired magnetic field configuration.

6,015,477

POINT-OF-USE AMMONIA PURIFICATION FOR ELECTRONIC COMPONENT MANUFACTURE

Joe G. Hoffman, Cardiff-by-the-Sea, and R. Scot Clark, Fallbrook, both of Calif., assignors to Air Liquide America Corporation, Houston, Tex.

Continuation of application No. 08/610,261, Mar. 4, 1996, Pat. No. 5,755,934, which is a continuation of application No. 08/179,001, Jan. 7, 1994, Pat. No. 5,496,778. This application May 22, 1998, Appl. No. 83,184.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B01D *3/42;* **C01B** *7/19*
U.S. Cl. 203—13 **10 Claims**



1. A method for the preparation of ultra-high-purity ammonia, said method comprising:
(a) drawing ammonia gas from a vapor space above liquid ammonia in an ammonia-containing reservoir;
(b) passing said ammonia gas through a scrubber whereby said ammonia gas is contacted with an aqueous solution of ammonia in deionized water; and
(c) recovering said ammonia gas emerging from said scrubber.

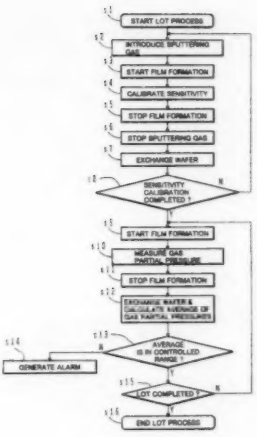
6,015,478

VACUUM PROCESSING METHOD

Kazutoshi Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 25, 1997, Appl. No. 805,752
Claims priority, application Japan, Jun. 7, 1996, 8-146286
Int. Cl.[7] C23C *14/54*
U.S. Cl. 204—192.13 **9 Claims**

1. A vacuum processing method using a vacuum processing apparatus comprising a process chamber capable of being evacuated, gas introducing means for introducing a process gas including a plurality of gasses into said process chamber, and a gas quantity detector for outputting a gas quantity signal corresponding to a partial pressure of each of said plurality of gasses contained in the process chamber, said gas quantity detector having a set detection sensitivity set in response to a sensitivity calibration signal externally supplied and generating the gas quantity signal at the set detection sensitivity, said vacuum processing method comprising:



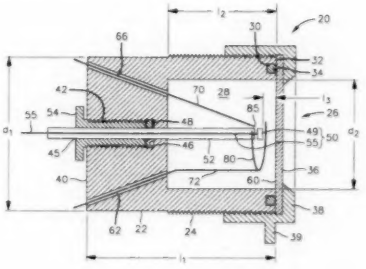
a step of outputting from the gas quantity detector a gas quantity signal of a reference gas, selected from the plurality of gasses contained in the process gas;
a step of generating a sensitivity calibration signal in response to the gas quantity signal of said reference gas sent from said gas quantity detector;
a step of sending the sensitivity calibration signal to said gas quantity detector;
a step of adjusting the sensitivity of the gas quantity detector so that a magnitude of the gas quantity signal for said reference gas reaches a target value.

6,015,479

THIN-LAYER SPECTROELECTROCHEMICAL CELL

Pamela A. Boss, and Roger D. Boss, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 25, 1997, Appl. No. 900,983
Int. Cl.[7] G01N *21/00;27/26;* **G07J** *3/00;3/30*
U.S. Cl. 204—412 **9 Claims**



1. An electrochemical system, comprising:
an electrochemical cell which includes:
a cell body having a sample chamber;
a working electrode extending through said cell body into said sample chamber,
a counter electrode extending through said cell body into said sample chamber;
a reference electrode extending through said cell body into said sample chamber;
a window; and
a cap for sealing said window against said cell body.

6,015,480

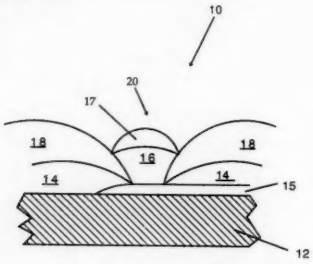
CHLORIDE ION SELECTIVE MEMBRANE ELECTRODE HAVING IMPROVED STABILITY AND SELECTIVITY

Alan Robert Craig, Wilmington, Del.; Michael Patrick Reidy, Foster City, Calif., and Chengrong Wang, Hockessin, Del., assignors to Dade Behring Inc., Deerfield, Ill.

Continuation-in-part of application No. 08/784,880, Jan. 16, 1997, abandoned. This application Sep. 4, 1997, Appl. No. 923,182.

Int. Cl.[7] G01N 27/26

U.S. Cl. 204—418 7 Claims



1. An ion-selective-electrode sensor membrane for determining the presence of chloride in fluids, the membrane comprising:

a first polymeric layer having a polymeric bonding material consisting of mixtures of methyl methacrylate and chloromethyl styrene copolymer that have been reacted with tertiary amines and at least 8 mole-percent of quaternary ammonium groups covalently bound to said polymeric bonding material; and,

a second polymeric layer comprising a chloride ionophore,

wherein the first polymeric layer is positioned between the second polymeric layer and the fluids, thereby increasing the uselife of the selectivity and sensitivity of the membrane in the presence of interfering anions within the fluids.

6,015,481

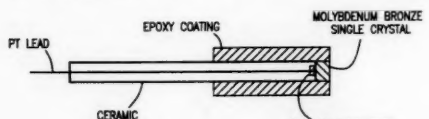
ION SELECTIVE SENSORS BASED ON MOLYBDENUM BRONZES

Martha Greenblatt, Highland Park; Pavel Shuk, Piscataway, and Kandalam V. Ramanujachary, Deptford, all of N.J., assignors to The State University of Rutgers, Piscataway, N.J.

Provisional application No. 60/035,482, Jan. 13, 1997. This application Jan. 13, 1998, Appl. No. 6,375.

Int. Cl.[7] G01N 27/26

U.S. Cl. 204—419 28 Claims



1. An apparatus for detecting ion concentration in an analyte comprising:

a) an elongate, generally cylindrical housing having a proximal end and a distal end, a hollow inner core and an outer surface;

b) a stoichiometric molybdenum oxide bronze ion sensor supported at one end of said housing for contacting said analyte and detecting said ion concentration therein by establishing an electrical potential corresponding to said ion concentration in said analyte, said ion sensor undergoing ion-exchange with said analyte; and

c) a processing means operatively connected to said sensor for converting said electrical potential into a measurement of ion concentration.

6,015,482

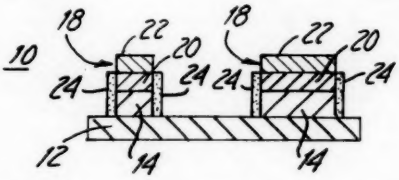
PRINTED CIRCUIT MANUFACTURING PROCESS USING TIN-NICKEL PLATING

Theodore R. Stern, Minneapolis, Minn., assignor to Circuit Research Corp., Delano, Minn.

Filed Dec. 18, 1997, Appl. No. 993,389

Int. Cl.[7] C25D 5/02

U.S. Cl. 205—125 15 Claims



1. A method for manufacturing a printed circuit, the method comprising:

providing a board defined by a substrate having at least one surface coated with copper material;

printing a circuitry pattern onto the copper-coated surface of the board such that the circuitry pattern is defined by exposed portions of the copper-coated surface, and the remainder of the copper-coated surface is covered with a resist material;

plating a tin-nickel material onto the exposed copper surface such that a resulting tin-nickel material deposit maintains long-term solderability independent of other coatings;

stripping the resist material; and

etching the copper surface not otherwise plated with the tin-nickel material.

6,015,483

PROCESS FOR THE NO-REMOVAL FROM ENGINE EXHAUST GASES

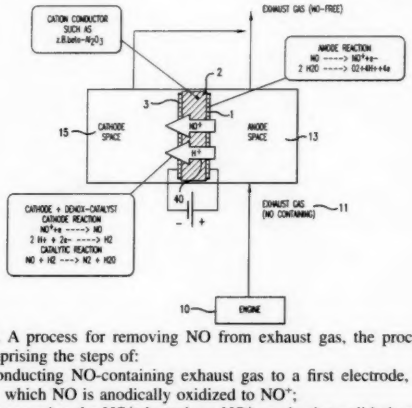
Carsten Plog, Markdorf; Renato Andorf, Meckenbeuren; Ralf Mueller, Aulendorf; Wolfgang Schaefer, Friedrichshafen, and Armin Kayser, Meersburg, all of Germany, assignors to DORNIER GmbH, Germany

Filed Apr. 2, 1998, Appl. No. 53,517

Claims priority, application Germany, Apr. 2, 1997, 197 13 633

Int. Cl.[7] C25B 1/00

U.S. Cl. 205—763 14 Claims



1. A process for removing NO from exhaust gas, the process comprising the steps of:

conducting NO-containing exhaust gas to a first electrode, on which NO is anodically oxidized to NO^+;

transporting the NO^+ through an NO^+-conducting solid electrolyte which adjoins the first electrode to a second electrode;

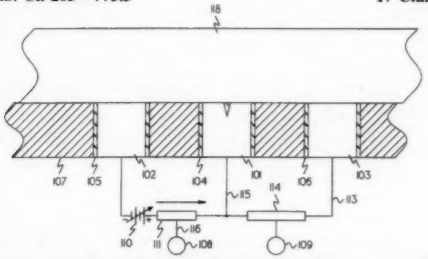
cathodically reducing the NO^+ on the second electrode **3** to NO; and

reducing the NO present on a side of the second electrode.

6,015,484
DETECTION OF PITTING CORROSION

Gregory A. Martinchek, Langhorne, and Max R. Yaffe, Maple Glen, both of Pa., assignors to Gamry Instruments, Inc., Warminster, Pa.

Filed Nov. 26, 1997, Appl. No. 978,837
Int. Cl.[7] G01N *27/26*
U.S. Cl. 205—775.5 **17 Claims**



10. A method for detecting localized corrosion of a material surface exposed to an environment comprising the steps of:

(a) providing an anodically biased electrode and a cathodically biased electrode having surfaces of substantially the same composition as the material surface and a reference electrode;

(b) exposing said electrodes to the same environment as the material surface;

(c) producing a first signal that represents the current flowing between said anodically biased electrode and said cathodically biased electrode;

(d) producing a second signal that represents the potential between said anodically biased electrode and said reference electrode; and

(e) processing said first signal and said second signal to yield an output signal indicative of the degree of localized corrosion occurring at the material surface.

6,015,485
HIGH ACTIVITY CATALYSTS HAVING A BIMODAL MESOPORE STRUCTURE

Peter Joseph Shukis, Bethany; James Donald Carruthers, Fairfield, and Vincent Joseph Lostaglio, Stamford, all of Conn., assignors to Cytec Technology Corporation, Wilmington, Del.

PCT No. PCT/US94/05293, § 371 Date Sep. 25, 1995, § 102(e) Date Sep. 25, 1995, PCT Pub. No. WO95/31280, PCT Pub. Date Nov. 23, 1995
PCT Filed May 13, 1994, Appl. No. 433,381
Int. Cl.[7] C10G *47/02;35/06;45/04;* **B01J** *21/04*
U.S. Cl. 208—112 **112 Claims**

1. A catalyst composition comprising a particulate porous support containing gamma alumina, having a surface area of at least 100 square meters per gram, as measured by nitrogen adsorption, and a pore volume of at least 0.25 cubic centimeters per gram, as measured by mercury porosimetry, and impregnated with one or more catalytically active metals, characterized in that the catalyst contains a nanocrystalline phase of alumina of a crystallite size at the surface of from 8 Å to 25 Å in combination with the gamma alumina which has a crystallite size at the surface of the catalyst of greater than 30 Å; and that the catalyst possesses an at least bimodal mesopore structure.

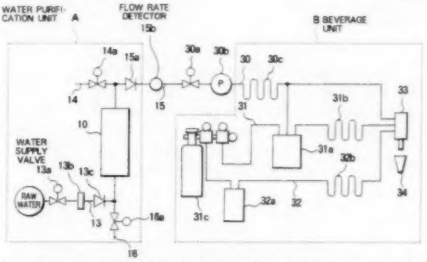
19. A process for the catalytic hydrodesulfurization of a hydrocarbon-containing feed comprising the step of contacting the feed under hydrodesulfurization conditions with a catalyst composition comprising a particulate porous support containing gamma alumina, having a surface area of at least 100 square meters per gram, as measured by nitrogen adsorption, and a pore volume of at least 0.25 cubic centimeters per gram, as measured by mercury porosimetry, and impregnated with one or more catalytically active metals for hydrodesulfurization, characterized in that the catalyst contains a nanocrystalline phase of alumina of a crystallite size at the surface of from 8 Å to 25 Å in combination with the gamma alumina which has a crystallite size at the surface of the catalyst of greater than 30 Å; and that the catalyst possesses an at least bimodal mesopore structure.

79. A process for the catalytic hydrocracking of a hydrocarbon-containing feed comprising the step of contacting the feed under hydrocracking conditions with a catalyst composition comprising a particulate porous support containing gamma alumina, having a surface area of at least 100 square meters per gram, as measured by nitrogen adsorption, and a pore volume of at least 0.25 cubic centimeters per gram, as measured by mercury porosimetry, and impregnated with one or more catalytically active metals for hydrocracking, characterized in that the catalyst contains a nanocrystalline phase of alumina of a crystallite size at the surface of from 8 Å to 25 Å in combination with the gamma alumina which has a crystallite size at the surface of the catalyst of greater than 30 Å; and that the catalyst possesses an at least bimodal mesopore structure.

6,015,486
DISPENSING APPARATUS CAPABLE OF AVOIDING VARIATION IN DISPENSED AMOUNT AND IMPROVING A SANITARY CONDITION

Kazushige Watanabe, Maebashi, Japan, assignor to Sanden Corporation, Japan

Filed May 13, 1998, Appl. No. 76,765
Claims priority, application Japan, May 15, 1997, 9-125633
Int. Cl.[7] B01D *17/12;24/46*
U.S. Cl. 210—87 **8 Claims**



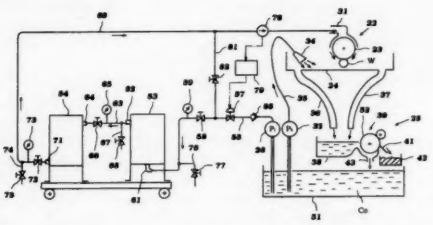
1. A dispensing apparatus for dispensing a beverage, comprising a water purification unit for purifying raw water to produce purified water, a beverage unit for producing the beverage by the use of the purified water, a pipeline connected between said water purification unit and said beverage unit for conducting the purified water from said water purification unit to said beverage unit, detecting means connected to said pipeline for detecting flow of the purified water in the pipeline to produce a detected signal, and control means connected to said detecting means for initiating and stopping the supply of the raw water into said water purification unit in response to, presence or absence, respectively, of said detected signal, said detecting means comprising a flow rate detector for detecting a flow rate of the purified water in said pipeline to produce a flow rate signal as said detected signal.

6,015,487
COOLANT PURIFICATION SYSTEM

Kazuaki Mori, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 20, 1998, Appl. No. 63,017
Claims priority, application Japan, Apr. 19, 1997, 9-108611; Apr. 19, 1998, 10-088379
Int. Cl.[7] B01D *17/12:35/06;35/47*
U.S. Cl. 210—90 **21 Claims**

1. A system for recovery and cleaning a machining liquid coolant comprised of a coolant storage tank for storing coolant, a machining station wherein a machining operation is performed.



and a coolant circulating and purifying line for circulating coolant from said coolant storage tank to said machining station and back to said coolant storage tank, a magnetic separator for separating magnetic particles from said coolant, an amorphous filter for separating particles from said coolant, and a mechanical filter for filtering foreign particles from said coolant, said coolant circulating and purifying line circulating coolant in a series relationship through said magnetic separator, said amorphous filter and said mechanical filter.

14. The system of claim **1**, wherein there are manual shut off valves in the line on the inlet and outlet sides of at least one of the filters.

15. The system of claim **14**, wherein there is also a bypass line between the coolant storage tank and the machining station so that coolant can be supplied to the machining station even when the manual shut off valves are closed.

16. The system of claim **15**, wherein there is a pressure indicator between one of the manual shut of valves and the at least one filter.

6,015,488

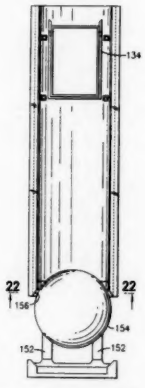
FILTER SYSTEM FOR SEPTIC TANK

Norman W. Gavin, 2545 Ridge Rd., Hamden, Conn. 06473

Continuation-in-part of application No. 08/823,868, Mar. 25, 1997, Pat. No. 5,871,640. This application Nov. 12, 1998, Appl. No. 189,930.

Int. Cl.[7] **B01D** *29/33*

U.S. Cl. 210—123 **8 Claims**



1. A filter system for use in a septic system tank, said filter system comprising:

a first filter housing having a first open end at the bottom of the housing for receiving septic tank fluid and a second open end configured for receiving a removable filter element when the first filter housing is mounted in a septic tank containing septic tank fluid, a first outlet port mounted on a surrounding wall of said first filter housing,

means for mounting said first filter housing in a septic tank, fixed to said housing and adapted to provide a fluid flow connection between said first outlet port and an outlet in a septic tank wall,

a first filter mounted in said first filter housing, a first conduit providing a fluid flow connection between the interior of said first filter and said first outlet port,

said first filter housing including a defined section of said surrounding wall selectively removable to form an inlet port and means for connecting said first filter housing to a second predetermined filter housing so that the outlet port of said second predetermined filter housing is in fluid flow connection with said inlet port of said first filter housing,

means for closing said first open end buoyantly responsive closingly to fluid in a septic tank when said first filter housing is mounted in a septic tank, forming a second temporary filter at said first open end when said first filter is removed from said filter housing.

6,015,489

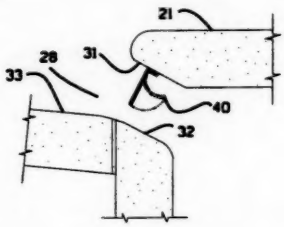
PLASTIC SELF-RELIEVING CURB INLET FILTER

Larry James Allen, and Bridgette Lyniece Allen, both of Hockley, Tex., assignors to Larry J. Allen, and Bridgett L. Allen, both of Hockley, Tex.

Filed Jan. 19, 1998, Appl. No. 9,442

Int. Cl.[7] **E03F** *5/06*

U.S. Cl. 210—131 **2 Claims**



1. A plastic self-relieving curb inlet filter, formed from a group of plasticized materials, for allowing fluids to pass and restricting the passage of debris, various sized sediment, small animals, children, and toys into a curb inlet opening having horizontal and vertical dimensions, a perimeter with boundaries and a front top inside wall, said plastic self-relieving curb inlet filter comprising:

a molded plastic self-relieving curb inlet filter, of substantially the same boundaries as the perimeter of said curb inlet, having a top horizontal attachment panel, said top horizontal attachment panel, having thickness, depth, an adhesive surface, and an outer edge, wherein said top horizontal attachment panel has a horizontal dimension less than the horizontal dimension of said curb inlet opening; and

a grid configuration of hydraulic openings, consisting of tubular horizontal members, of equal length and thickness of said top horizontal attachment panel, positioned parallel to and below said top horizontal attachment panel; and

tubular vertical members, of equal thickness to said top horizontal attachment panel and said tubular horizontal members, positioned perpendicular to said tubular horizontal members, and joined at 90 degrees to said outer edge of said top horizontal attachment panel, and with vertical dimension less than the vertical dimension of opening of said curb inlet; and

whereas adhesive is fixed to said adhesive surface of said top horizontal attachment panel to attach said top horizontal attachment panel to said front top inside wall of said curb inlet opening, whereas said plastic self-relieving curb inlet filter can be configured with a plurality of said tubular horizontal and vertical members positioned for various sizes of said hydraulic openings; and

whereas the accumulation of debris or sediment moves said plastic self-relieving curb inlet filter from a fixed position to allow said debris or sediment to pass into said curb inlet opening, wherein said plastic self-relieving curb inlet filter returns to said fixed position, after allowing said debris or sediment to pass therethrough.

6,015,490

CARRIER-SEPARATING AND WATER-COLLECTING MECHANISM OF WASTEWATER TREATMENT EQUIPMENT

Noboru Katsukura; Takehiko Yamada, and Eiji Tochikubo, all of Tokyo, Japan, assignors to Ebara Corporation, Tokyo, Japan

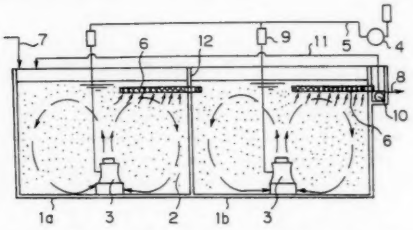
PCT No. PCT/JP96/01364, § 371 Date Mar. 9, 1998, § 102(e) Date Mar. 9, 1998, PCT Pub. No. WO96/37443, PCT Pub. Date Nov. 28, 1996

PCT Filed May 23, 1996, Appl. No. 952,610

Claims priority, application Japan, May 23, 1995, 7-146960; Feb. 14, 1996, 8-049640

Int. Cl.[7] **C02F** *3/02*

U.S. Cl. 210—151 **12 Claims**



1. A carrier-separating and liquid-collecting mechanism in a liquid-waste treatment apparatus having a treatment tank in which carriers having microorganisms immobilized thereon are suspended, said carrier-separating and liquid-collecting mechanism comprising:

a plurality of cylindrical screens and a plurality of liquid-collecting means disposed in said cylindrical screens, respectively,

wherein said cylindrical screens are disposed in said treatment tank such that an axis of each of said cylindrical screens extends in a substantially horizontal direction from a side wall of said treatment tank toward a center of said treatment tank, and said liquid-collecting means is capable of collecting liquid at a plurality of positions in each cylindrical screen; and

an air cleaning pipe, for removing scum, disposed below at least one of said cylindrical screens.

6,015,491

APPARATUS FOR PRESSURE EQUALIZATION AND FLUSHING IN A VESSEL

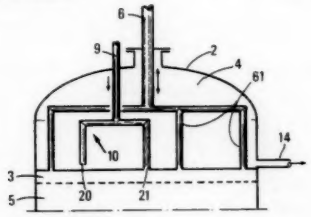
Pierre Renard, Saint nom la Breteche; Olivier Callebert, Rueil Malmaison, and Jean Paul Dessapt, Beynes, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Nov. 18, 1997, Appl. No. 972,894

Claims priority, application France, Nov. 19, 1996, 96/14186

Int. Cl.[7] **B01D** *15/08*

U.S. Cl. 210—198.2 **16 Claims**



1. A apparatus for equalising pressure and flush in a vessel (**1**) having at least one concave extremity, the vessel comprising a chromatographic separation chamber (**5**) or a reaction chamber, at least one distribution plate (**3**) or collection plate located in the vessel, a pressure equalisation chamber (**4**) defined at least in part by the extremity of said vessel and by a first face of the plate, the separation chamber (**5**) or reaction chamber being at least partially defined by a second face of said distribution or collection plate, a first conduit (**6**) which places a first fluid in communication with the distribution or collection plate, the separation or reaction chamber (**5**) communicating with the equalisation chamber (**4**) via a flush chamber (**10**) comprising a first opening (**21**), the apparatus being characterized in that a line (**9**) for supplying a second fluid which is substantially pure or substantially non contaminated is directly connected to the flush chamber at a point such that a portion of said second fluid can circulate towards the pressure equalisation chamber via a further outlet opening (**20**) and the remaining portion can circulate towards the separation or reaction chamber via the first opening (**21**), and in that said pressure equalisation chamber (**4**) is connected to a means (**14**) for evacuating the fluid it contains.

6,015,492

FUEL FILTER ASSEMBLY WITH REPLACEABLE ELEMENT

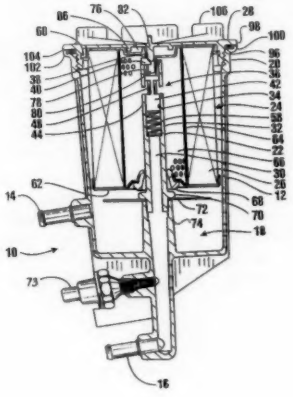
Peter Popoff; David H. Hodgkins, both of Modesto; Michael D. Clausen, Turlock, and Victor R. Oelschlaegel, Modesto, all of Calif., assignors to Parker Hannifin Customer Support Inc., Irvine, Calif.

Continuation of application No. 08/731,114, Oct. 9, 1996, Pat. No. 5,770,065, which is a continuation of application No. 08/441,584, May 15, 1995, abandoned, which is a continuation of application No. 08/121,803, Sep. 15, 1993, abandoned. This application May 1, 1998, Appl. No. 71,399.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B01D** *35/34*

U.S. Cl. 210—238 **50 Claims**



1. A filter subassembly comprising a filter element and a cover, said filter element including:

a first imperforate circular end cap having an outer surface and an inner surface;

a continuous ring of filter media circumscribing a central axis, said ring having an interior surface bounding an interior area, said ring bonded in fluid-tight relation to the inner surface of said first end cap, and said interior area being closed at an end thereof by the first end cap;

a second circular end cap longitudinally disposed from said first end cap and bonded in fluid-tight relation to said media ring, said second end cap having an opening therethrough axially aligned with the central axis of the ring;

a resilient seal circumferentially bounding the opening in the second end cap;

said cover being disposed adjacent the outer surface of said first end cap; and

latching fingers unitary with said first end cap and cooperating between said cover and said first end cap for removeably coupling the filter element to the cover, said latching fingers disposed in radially-outward relation to said first end cap.

10. The filter subassembly as in claim **1**, wherein said cover further includes outwardly-projecting wing projections to enable said cover to be manually held and turned.

6,015,493

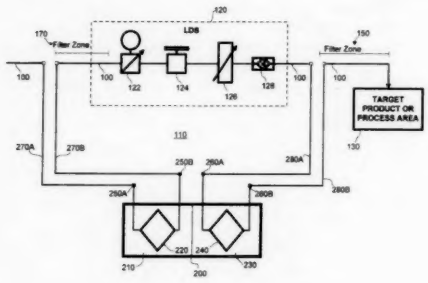
MULTIPLE FILTRATION BYPASS METHOD AND APPARATUS FOR REDUCING PARTICLES IN LIQUID DISTRIBUTION SYSTEMS

Kenneth Smith, Cupertino; Brent Krick, Mountain View, and Alejandro Garcia, Union City, all of Calif., assignors to Teleparts International, Inc., Fremont, Calif.

Filed Jul. 14, 1997, Appl. No. 893,602

Int. Cl.[7] **B01D** *35/00*

U.S. Cl. 210—252 **18 Claims**



1. An apparatus for filtering liquid within a liquid distribution system having one or more components, a liquid channel through which liquid can flow into and out of each of the components, and an input channel which receives the liquid before said liquid flows into the liquid channel, wherein a first distance separates an input end of the liquid channel from an output end of the input channel, the apparatus comprising:

a plurality of filtration systems, each having an input port and an output port;

a plurality of channel diverting extensions from the liquid distribution system; and

a plurality of channel return extensions to the liquid distribution system, wherein each of the channel diverting extensions is coupled between the liquid distribution system and a different one of the input ports of the filtration systems, with at least one of the channel diverting extensions having length greater than the first distance and being coupled between the output end of the input channel and the input end of the liquid channel, and wherein each of the channel return extensions is coupled between the liquid distribution system and a different one of the output ports of the filtration systems, with one of the channel return extensions having length greater than the first distance and being coupled between the output end of the input channel and the input end of the liquid channel, wherein at least one of the channel diverting extensions and the channel return extensions is detachably coupled to one of the filtration systems or to the liquid distribution system.

6,015,494

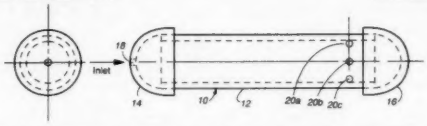
POLYOLEFIN OIL/WATER SEPARATOR

Todd D. Siverling, Albuquerque; William Anthony Chroninger, Los Alamos; William Andrew Chroninger, Rio Rancho; Kreg T. Gauss, and William S. Radzinski, both of Alamos, all of N. Mex., assignors to The Regents of the University of California, Los Alamos, N. Mex.

Continuation of application No. 08/219,581, Mar. 28, 1994, abandoned. This application Jul. 24, 1996, Appl. No. 685,790.

Int. Cl.[7] **B01D** *21/00;47/14*

U.S. Cl. 210—299 **13 Claims**



1. An apparatus for separating oil from water in an oil/water mist thereof entrained in a gas flow, said apparatus consisting essentially of:

a. a hollow separator element having an inlet port for admitting gases in which an oil/water mist is entrained, and at least one exit port located away from the inlet port; and

b. shredded fibrous polyolefin sheet packed into said hollow separator element, whereby the gas flow is not substantially impeded, water and unabsorbed gas may exit through the at least one exit port in said separator element, and oil is absorbed by said fibrous polyolefin.

6,015,495

COMPOSITE POLYAMIDE REVERSE OSMOSIS MEMBRANE AND METHOD OF PRODUCING THE SAME

Ja-Young Koo, Acton, Mass., and Nowon Kim, Pusan, Rep. of Korea, assignors to Saehan Industries Incorporation, Rep. of Korea

Filed Feb. 18, 1998, Appl. No. 25,520

Int. Cl.[7] **B01D** *39/16*

U.S. Cl. 210—500.38 **61 Claims**

1. A polyamide membrane, said polyamide membrane comprising a reaction product of (i) an aqueous solution, said aqueous solution comprising a polyfunctional amine and a mixed solvent, said mixed solvent comprising water and a polar compound, said polar compound being selected from the group consisting of di(propylene glycol) monoalkyl ethers; alkyl-substituted 1,3-propanediols; di(ethylene glycol) hexyl ether; di(ethylene glycol) t-butyl methyl ether; tri(ethylene glycol) dimethyl ether; and 1,x-cyclohexanedimethanol wherein x is an integer from 2 to 4; and (ii) an organic solvent solution, said organic solvent solution comprising an amine-reactive reactant selected from the group consisting of a polyfunctional acyl halide, a polyfunctional sulfonyl halide and a polyfunctional isocyanate.

6,015,496

IN-SEWER TREATMENT OF WASTEWATER AND SLUDGES

Boris M. Khudenko, 744 Moores Mill Rd., Atlanta, Ga. 30327

Continuation-in-part of application No. 08/532,606, Oct. 12, 1995, Pat. No. 5,616,241, which is a continuation-in-part of application No. 08/181,387, Jan. 13, 1994, Pat. No. 5,514,278, which is a continuation-in-part of application No. 08/102,618, Aug. 5, 1993, Pat. No. 5,514,277, which is a continuation-in-part of application No. 08/046,788, Apr. 12, 1993, abandoned. This application Mar. 26, 1997, Appl. No. 824,608.

Int. Cl.[7] **C02F** *3/12*

U.S. Cl. 210—603 **20 Claims**

1. A method of wastewater treatment in a pipe network for collecting and transporting wastewater comprising the step of feeding conditioned sludge in the said pipe network, whereby the

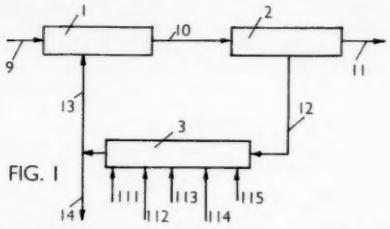


FIG. 1

said conditioned sludge comprises organisms selected from the group consisting of nitrifying organisms, aerobic organisms, facultative organisms, anaerobic organisms, methanogenic organisms, and combinations thereof.

6,015,497

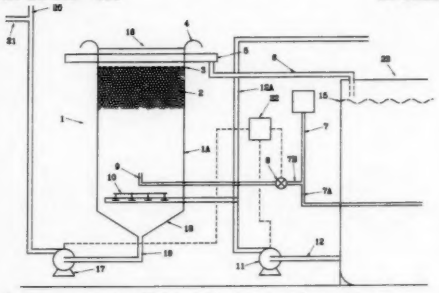
FILTRATION SYSTEM AND METHOD FOR REMOVING BIOLOGICAL WASTES FROM AQUACULTURE TANKS

Albert Charles Steen, Jr., 125 N. Main St., Abbeville, La. 70510

Filed Dec. 17, 1997, Appl. No. 992,666

Int. Cl.[7] C02F *3/08*

U.S. Cl. 210—618 **20 Claims**



1. A system for the filtration of water used for cultivating aquatic animals, comprising:

(a) an aqua-culture tank containing a level of water therein;

(b) a filtration tank elongated vertically which has a top at a height above the level of water in the aqua-culture tank, a bottom, a horizontal cross-section and a screen having openings, which said screen spans said horizontal cross-section of said filtration tank below said top and at a height above the level of water in the aqua-culture tank;

(c) a bed of buoyant filter media comprised of particles which are larger than the openings in said screen, said bed having a top and a bottom disposed below said screen;

(d) a filtration tank influent line fluidly connecting said aqua-culture tank to a point in said filtration tank which is below the bed of buoyant filter media;

(e) a circulation pump disposed in said filtration tank influent line;

(f) a gas supply line connected to a point in said filtration tank which is below the bed of buoyant filter media; and

(g) a filtration tank effluent line fluidly connecting a point in said filtration tank above said screen to said aqua-culture tank;

whereby, when water is being pumped upwardly through said filtration tank said buoyant filter media is constrained by said screen, but when water is not being pumped a water level in said filtration tank equalizes with said water level in said aqua-culture tank, thereby permitting said buoyant filter media to float loosely in said water for ease of agitation.

13. A method for the cleaning of buoyant filter media used to filter water in an aqua-culture tank, comprising the steps of:

(a) providing a filtration tank elongated vertically which has a top at a height above the level of water in the aqua-culture tank, a bottom, a horizontal cross-section and a screen having openings, which said screen spans said horizontal cross-section of said filtration tank below said top and at a height above the level of water in the aqua-culture tank;

(b) providing a bed of buoyant filter media comprised of particles which are larger than the openings in said screen;

(c) providing a filtration tank influent line fluidly connecting said aqua-culture tank to a point in said filtration tank which is below the bed of buoyant filter media;

(d) providing a circulation pump disposed in said filtration tank influent line;

(e) providing a gas supply line connected to a point in said filtration tank which is below the bed of buoyant filter media;

(f) providing a filtration tank effluent line fluidly connecting a point in said filtration tank above said screen to said aqua-culture tank;

(g) operating said circulation pump to circulate water from said aqua-culture tank upward through said bed of buoyant filter media until said bed of buoyant filter media requires cleaning;

(h) loosening the bed of buoyant filter media from said screen by stopping said circulation pump, thereby allowing gravity to lower the water in the filtration tank until it is equalized with the level of water in the aqua-culture tank below said screen; and

(i) agitating the loosened buoyant filter media by upflow of gas therethrough.

6,015,498

COAL ASHES USED FOR TREATING VARIOUS MEDIA AND FACILITIES FOR USING SAME

Raymond M. Gleizes, 73 Les Mélèzes, 95680 Montlignon, France, assignor to Raymond M. Gleizes, Montlignon, and Terrils, Lens, both of France

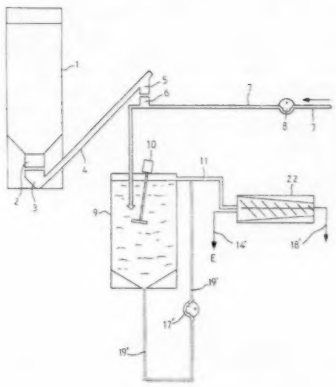
PCT No. PCT/FR96/00722, § 371 Date Nov. 10, 1997, § 102(e) Date Nov. 10, 1997, PCT Pub. No. WO96/36434, PCT Pub. Date Nov. 21, 1996

PCT Filed May 13, 1996, Appl. No. 930,109

Claims priority, application France, May 19, 1995, 95 05968; Feb. 14, 1996, 96 01796

Int. Cl.[7] B01D *15/00*

U.S. Cl. 210—688 **10 Claims**



1. Process for the treatment of a liquid or semiliquid medium, which comprises:

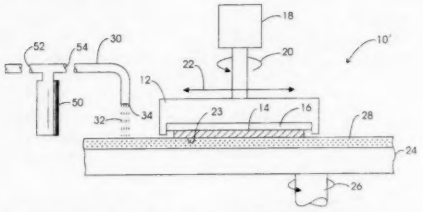
contacting the medium to be treated with from 0.2 to 2% by weight, relative to the volume of the medium to be treated, of coal fly ash produced by burning in a boiler with a circulating fluidized bed, at a temperature of about 850° C., said ash having a particle size such that at least 80% by weight passes through a screen having a mesh opening of 80 μm.

6,015,499

MEMBRANE-LIKE FILTER ELEMENT FOR CHEMICAL MECHANICAL POLISHING SLURRIES

Daniel B. Hayden, Thorntown, Ind., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 17, 1998, Appl. No. 62,386
Int. Cl.[7] B01D *37/00;* **B24B** *1/00;57/00*
U.S. Cl. 210—767 **15 Claims**



1. A method of physically separating agglomerations of particles of an abrasive having a mean average particle size of between about 20–35 μm from a chemical-mechanical polishing (CMP) process slurry stream while substantially retaining the non-agglomerated particles of said abrasive in the stream, said method comprising the steps of:

(a) providing a filter media having a first and second side and being formed of at least one sheet of a fabric having a first and second surface defining a thickness dimension of said fabric therebetween, said fabric being woven of polymeric monofilament fibers and having a mean average pore size of between about 50–80 μm;

(b) supplying the slurry stream to the first side of said filter media; and

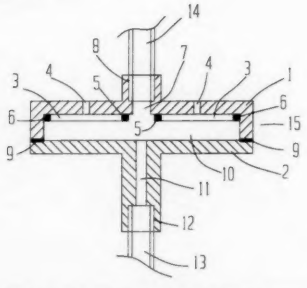
(c) passing the slurry stream through said filter media to the second side thereof whereby at least a portion of the agglomerations of the abrasive are retained on the first side of said media.

6,015,500

FILTRATION DEVICE USEABLE FOR REMOVAL OF LEUKOCYTES AND OTHER BLOOD COMPONENTS

Peter Zuk, Jr., Harvard, Mass., assignor to Hemasure Inc., Marlborough, Mass.

Continuation of application No. 08/680,674, Jul. 16, 1996, Pat. No. 5,902,490, which is a continuation of application No. 08/661,804, Jun. 11, 1996, abandoned, which is a continuation of application No. 08/449,362, May 24, 1995, abandoned, which is a division of application No. 08/209,523, Mar. 10, 1994, Pat. No. 5,472,605. This application Jul. 20, 1998, Appl. No. 119,292.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B01D *37/00;35/01*
U.S. Cl. 210—767 **54 Claims**



12. A method of processing a biological liquid comprising:

flowing biological liquid through an inlet of a processing system, said processing system having a port therein covered with a hydrophobic filter media, said port leading to outside of said system and adapted to keep the system sterile;

restricting the flow of liquid downstream of the port and upstream of an outlet of said processing system while flowing said liquid through the system and through a filtration media so that the pressure head of the liquid in the system at the level of said port is greater than atmospheric pressure, said port being located downstream of said inlet and upstream of said outlet; and

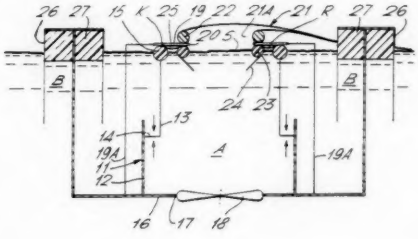
automatically allowing gas to enter the port when the pressure of the liquid in the system at the level of the port becomes less than atmospheric pressure to drain biological liquid remaining within the system into a receiving container.

6,015,501

METHOD AND APPARATUS FOR SKIMMING A FLOATABLE SURFACE LAYER FROM A WATER SURFACE

Stig Lundbäck, Vaxholm, Sweden, assignor to Humanteknik AB, Stockholm, Sweden

PCT No. PCT/SE96/01014, § 371 Date Feb. 13, 1998, § 102(e) Date Feb. 13, 1998, PCT Pub. No. WO97/07292, PCT Pub. Date Feb. 27, 1997
PCT Filed Aug. 14, 1996, Appl. No. 11,635
Claims priority, application Sweden, Aug. 14, 1995, 9502826; Oct. 10, 1995, 9503520; Oct. 16, 1995, 9503612
Int. Cl.[7] E02B *15/04*
U.S. Cl. 210—776 **24 Claims**



1. A method for skimming a floatable surface layer having a buoyant pollutant from a body of water, the method comprising the steps of:

disposing in the body of water a collection vessel having a collection compartment and a skimming weir which forms an upper part of the collection vessel and delimits the collection compartment upwardly, the skimming weir moves vertically relative to an underlying part of the collection vessel,

filling the collection compartment with water,

causing the skimming weir to take an overflow position relative to the surface layer to allow the surface layer to flow over the skimming weir into the collection compartment by forming and maintaining a water sink in the collection compartment,

controlling the overflow position of the skimming weir by applying to the skimming weir a vertical force having a magnitude of which varies in proportion to a difference in head pressure between the collection compartment and the body of water surrounding the collection vessel, and

discharging a supernatant layer of the surface layer in the collection compartment by displacing an amount of water taken from the body of water surrounding the collection vessel and introducing the amount into a lower portion of the collection compartment through a discharge opening which communicates with the collection compartment.

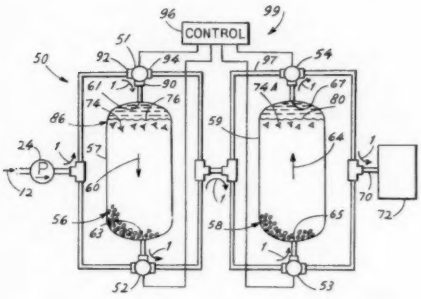
6,015,502
REVERSING FLOW COALESCING SYSTEM

Misak Dzhragatspanvan, Van Nuys, and William A. Greene, Long Beach, both of Calif., assignors to Spintek Systems, Inc., Huntington Beach, Calif.

Provisional application No. 60/028,102, Oct. 9, 1996. This application Oct. 6, 1997, Appl. No. 944,602.

Int. Cl.[7] **B01D** *24/46;29/62;* **C02F** *1/00;1/28*

U.S. Cl. 210—793 **4 Claims**



1. A method for separating hydrocarbons from a fluid stream that includes an aqueous solution, solid particles and microscopic droplets of organic, comprising:

first passing said fluid stream that includes organic along a primarily vertical first path through a first media bed that is effective in coalescing said droplets into larger drops but that also traps said particles at a first end of said first bed and passing said stream from a second end of said first bed later to a separator that further coalesces said drops of organic;

reversing the direction of flow of said fluid stream through said first bed by passing said fluid stream that includes organic in a second path that is opposite to said first path through said first bed and later to said separator, said reversal causing said particles to transfer out from said first end of said first bed to flow to said separator;

again reversing the direction of flow of said fluid stream that includes organic through said first bed.

6,015,503
METHOD AND APPARATUS FOR SURFACE CONDITIONING

Jeffery W. Butterbaugh, Eden Prairie, Minn.; David C. Gray, Sunnyvale, Calif.; Robert T. Fayfield, St. Louis Park, Minn.; Kevin Siefering, Chaska, Minn.; John Heitzinger, St. Louis Park, Minn., and Fred C. Hiatt, Lakeville, Minn., assignors to FSI International, Inc., Chaska, Minn.

PCT No. PCT/US95/16649, § 371 Date Sep. 2, 1997, § 102(e) Date Sep. 2, 1997, PCT Pub. No. WO96/19825, PCT Pub. Date Jun. 27, 1996

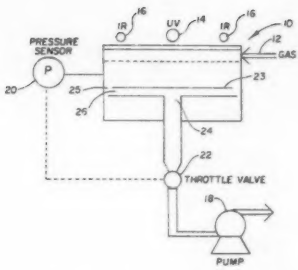
Continuation-in-part of application No. 08/360,387, Dec. 21, 1994, Pat. No. 5,580,421, which is a continuation-in-part of application No. 08/292,359, Aug. 18, 1994, Pat. No. 5,534,107, which is a continuation-in-part of application No. 08/259,542, Jun. 14, 1994, abandoned. This PCT application Dec. 21, 1995, Appl. No. 860,071.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C23F** *1/12*

U.S. Cl. 216—66 **23 Claims**

1. Apparatus for conditioning a substrate with a conditioning gas comprising a reactive gas, the substrate having a generally planar first surface to be conditioned, a generally parallel second surface and a perimeter, the apparatus comprising:



a chamber isolatable from the ambient environment and including a first gas inlet portion into which the conditioning gas is fed and a conditioning portion in which the substrate is conditioned with said conditioning gas;

support means for supporting the substrate in the conditioning portion of the chamber;

first pressure bias means for establishing a first pressure bias in the chamber such that the conditioning gas in the gas inlet portion of the chamber will be established at a first pressure and the conditioning gas in the conditioning portion will be provided to the substrate at a second pressure lower than the first pressure, both said first and second pressures being provided in a viscous flow regime;

inlet means for feeding conditioning gas into the gas inlet portion of the chamber so that the pressure differential between the gas inlet portion and the conditioning portion of the chamber will cause the conditioning gas to flow toward the first surface of the substrate wherein the reactive gas component thereof will chemically react with and condition the first surface of the substrate;

second pressure bias means for creating a second pressure bias across the first surface of the substrate such that the conditioning gas, after it has chemically reacted with the substrate surface, will flow outward from where it has reacted, off of the substrate in a substantially radial flow pattern toward a perimeter of the chamber, the second pressure bias means including at least one circular channel separated from the conditioning portion of the chamber and communicating therewith via a narrowed passageway, the narrowed passageway comprising an annular slot opening or a series of annularly spaced discrete holes located peripherally of the substrate, and the narrowed passageway having a cross sectional area less than the cross sectional area of the circular channel, and

exhaust means connected to the circular channel of the second pressure bias means for exhausting gas from the chamber.

6,015,504
METHOD FOR INCREASING THE SPF RATING OF TEXTILE FIBERS BY TREATMENT WITH TRIAZINYLDIAMINO STILBENE COMPOUNDS

Dieter Reinehr, Kandern, Germany; Claude Eckhardt, Riedisheim, France; Robert Hochberg, Freiburg, Germany; Werner Kaufmann, Rheinfelden, Switzerland, and Georges Metzger, Moernach, France, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of application No. 08/604,536, Feb. 21, 1996, Pat. No. 5,744,599. This application Jan. 26, 1998, Appl. No. 13,657.

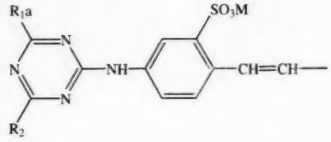
Claims priority, application United Kingdom, Feb. 22, 1995, 9503474

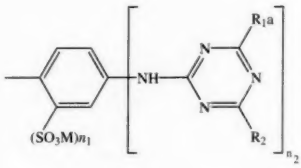
Int. Cl.[7] **D06L** *3/12;* **D06P** *1/62;* **D06M** *13/262*

U.S. Cl. 252—8.91 **28 Claims**

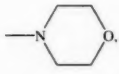
1. A method for increasing the SPF rating of textile fibres, comprising treating the textile fibres with 0.05 to 3.0% by weight, based on the weight of the textile fibres, of one or more compounds having the formula (1A):

(1A)

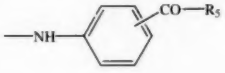




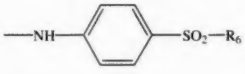
in which R_2 is hydrogen, optionally substituted alkyl, optionally substituted aryl,



$—NH_2$, $—N(CH_2CH_2OH)_2$, $—N(CH_2CH(OH)CH_3)_2$, —NH—R_4, $—N(R_4)_2$ or —OR_4, in which R^4 is M, optionally substituted alkyl or optionally substituted aryl;



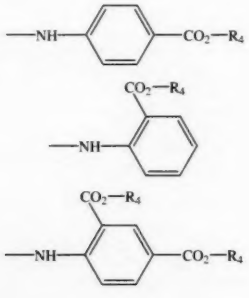
in which R_5 is hydrogen, optionally substituted alkyl, optionally substituted aryl or $—NR_7R_8$ in which R_7 and R_8, independently, are hydrogen, optionally substituted alkyl or optionally substituted aryl, or R_7 and R_8, together with the nitrogen atom to which they are attached, form a heterocyclic residue;



in which R_6 is hydrogen, optionally substituted alkyl or optionally substituted aryl, provided that R_6 is not carboxymethyl or hydroxymethyl;

n_1 and n_2, independently, are 0 or 1;

M is hydrogen, an alkali metal atom, ammonium or a cation formed from an amine and R_1a is a group having one of the formulae:



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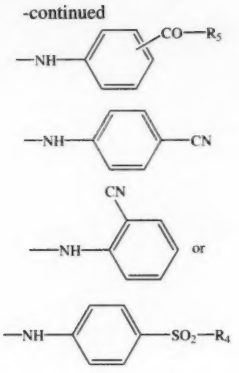


in which R_4 and R_5 are as previously defined.

6,015,505

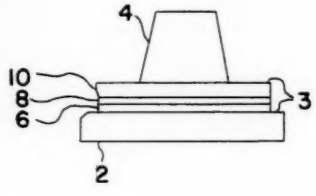
PROCESS IMPROVEMENTS FOR TITANIUM-TUNGSTEN ETCHING IN THE PRESENCE OF ELECTROPLATED C4'S

Lawrence D. David, Enfield, N.H., and Lisa A. Fanti, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1997, Appl. No. 960,839

Int. Cl.[7] **H01L** *21/00*

U.S. Cl. 252—79.2 **6 Claims**



1. A solution for wet etching a metal film in the presence of a protected metal on a substrate comprising hydrogen peroxide, potassium sulfate, and potassium EDTA wherein the pH of the solution is between about 2.7 and 4.0.

6,015,506

COMPOSITION AND METHOD FOR POLISHING RIGID DISKS

Christopher C. Streinz, Aurora; Matthew Neville, Geneva; Steven K. Grumbine, and Brian L. Mueller, both of Aurora, all of Ill., assignors to Cabot Corporation, Boston, Mass.

Continuation-in-part of application No. 08/753,482, Nov. 26, 1996. This application Apr. 18, 1997, Appl. No. 844,195.

Int. Cl.[7] **C09K** *13/00*

U.S. Cl. 252—186.1 **33 Claims**

1. A method for polishing a rigid disk comprising the steps of:

(a) providing a dispersion comprising a metal oxide abrasive, at least one oxidizing agent, and at least one catalyst having multiple oxidation states;

(b) applying the dispersion to at least one surface of the rigid disk; and

(c) removing at least a portion of a metal layer from the rigid disk by bringing a pad into contact with the surface of the rigid disk and moving the pad in relation to the rigid disk.

6,015,507
LIQUID CRYSTAL ELEMENT HAVING COMPOSITE LAYER

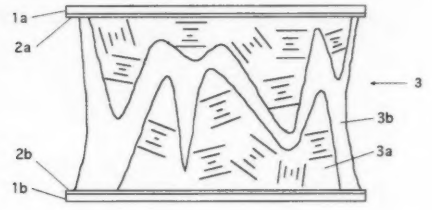
Nobuyuki Kobayashi, Kobe; Kiyofumi Hashimoto, and Takuji Hatano, both of Suita, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 8, 1995, Appl. No. 555,299

Claims priority, application Japan, Nov. 8, 1994, 6-273623; Apr. 13, 1995, 7-088098; Oct. 9, 1995, 7-261809

Int. Cl.[7] C09K *19/52;* **G02F** *1/137;1/1333*

U.S. Cl. 252—299.01 **27 Claims**



1. A liquid crystal element comprising a pair of plates at least one of which is transparent, and a composite layer retained between said plates, said composite layer including a transparent resin substrate and a liquid crystal material which has a cholesteric characteristic, wherein said liquid crystal material contains aromatic rings, said transparent resin substrate contains aromatic rings, and ratio of the number of aromatic rings to that of carbon atoms in the main chain of monomer of the transparent resin substrate is in a range from 1:5 to 1:12, the number of said carbon atoms being the number of carbon atoms of groups in the main chain of the monomer represented by $—CH_2—$, —CH— or the like except for aromatic rings, —CO— groups, and —COOH— groups.

6,015,508
LIQUID CRYSTALLINE COMPOUNDS CONTAINING HYDROCARBON GROUPS, LIQUID CRYSTALLINE COMPOSITIONS, AND LIQUID CRYSTAL DISPLAY ELEMENTS

Noriyuki Ohnishi, Ibaraki; Hiroyuki Takeuchi; Kazutoshi Miyazawa, both of Chiba; Norihisa Hachiya, Saitama, and Etsuo Nakagawa, Chiba, all of Japan, assignors to Chisso Corporation, Ohsaka-fu, Japan

Filed Feb. 26, 1998, Appl. No. 30,835

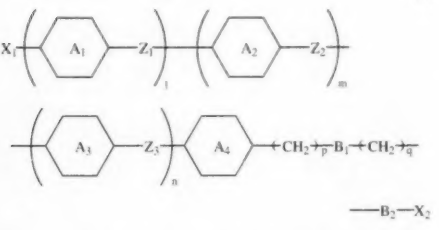
Claims priority, application Japan, Feb. 28, 1997, 9-062373

Int. Cl.[7] C09K *19/30;19/12;19/34;* **C07C** *15/12*

U.S. Cl. 252—299.63 **12 Claims**

1. A liquid crystalline compound of the general formula:

(1)



wherein X_1 stands for a hydrogen atom, a cyano group, a halogen atom, or an alkyl group with 1–20 carbon atoms, and one or more methylene groups in the alkyl group may be replaced by —CH≡CH—, —C≡C—, or oxygen atoms and one or more hydrogen atoms may be substituted by halogen atoms; X_2 stands for a hydrogen atom, an alkyl group with 1–10 carbon atoms, or a substituent of $—(A_5—Z_4)_s—A_6—X_3$; l, m, n and s each stands for an integer of 0 or 1, p, stands for an integer of 0–5; X_3 for an alkyl group with 1–10 carbon atoms; Z_1–Z_4 each independently stands for a covalent bond or an alkylene group with 1–5 carbon atoms, and one or more methylene groups in the alkylene group may be replaced by —CH═CH—, —C≡C—, or an oxygen atom and one or more hydrogen atoms in the alkylene group may be substituted by halogen atoms; the rings A_1–A_6 each independently stands for a 1,4-phenylene, a 1,4-cyclohexenylene, or a trans-1,4-cyclohexylene, and the carbon atoms in the ring may be replaced by nitrogen atoms or oxygen atoms and the hydrogen atoms in the ring may be substituted by halogen atoms or cyano groups; and B_1 and B_2 each independently stands for —CH═CH— or —C≡C—, with the proviso that both of B_1 and B_2 should not be —CH═CH— at the same time.

6,015,509
COMPOSITION CONTAINING A POLYMER AND CONDUCTIVE FILLER AND USE THEREOF

Marie Angelopoulos, Cortlandt Manor; Vlasta A. Brusic, Amawalk; Teresita Ordonez Graham, Irvington; Sampath Purushothaman, Yorktown Heights; Ravi F. Saraf, Briarcliff Manor, all of N.Y.; Jane Margaret Shaw, Ridgefield, Conn.; Judith Marie Roldan, Ossining, and Alfred Viehbeck, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 08/356,026, Dec. 14, 1994, Pat. No. 5,700,398. This application Sep. 12, 1997, Appl. No. 928,495.

Int. Cl.[7] H01B *1/06*

U.S. Cl. 252—500 **16 Claims**

1. A composition comprising a thermoset or thermoplastic polymeric matrix, and a conductive filler component, where said filler component comprises electrically conductive particles and at least one conducting polymer selected from the group consisting of substituted and unsubstituted polyparaphenylenevinylenes, substituted and unsubstituted polyanilines, substituted and unsubstituted polyazines, substituted and unsubstituted polythiophenes, substituted and unsubstituted polyparaphenylenes, substituted and unsubstituted poly-p-phenylene sulfides, substituted and unsubstituted polyfuranes, substituted and unsubstituted polypyrroles, substituted and unsubstituted polyselenophenes, substituted and unsubstituted polyacetylenes, mixtures thereof, and copolymers thereof, being obtained by separately admixing the conducting polymer and the conductive particles with the polymeric matrix.

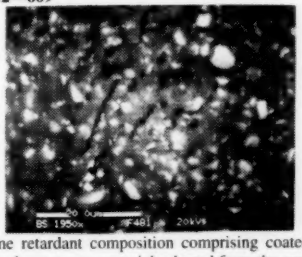
6,015,510
POLYMER FLAME RETARDANT

Howard Wayne Jacobson, Wilmington, Del., and Robert Valentine Kasowski, West Chester, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1996, Appl. No. 705,938

Int. Cl.[7] C09K *21/10;21/12*

U.S. Cl. 252—609 **4 Claims**



1. A flame retardant composition comprising coated particles, said particles have a core material selected from the group consist-

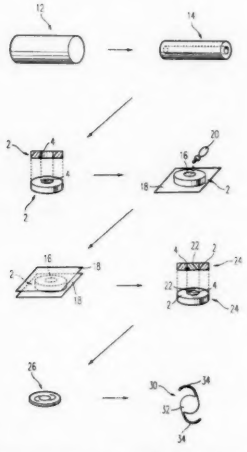
ing of melamine polyphosphate, melamine pyrophosphate, and mixtures thereof; said core material has at least one coating selected from the group consisting of silane, ester, dianhydride, dicarboxylic acid, and mixtures thereof; wherein the said core material comprises from about 94 weight percent to 99.9 weight percent of the composition, and the said coating comprises from about 0.1 weight percent to about 6.0 weight percent of the composition.

6,015,511

METHOD FOR PRODUCING AN INTRAOCULAR LENS

Akihiro Yasuda, and Kazuharu Niwa, both of Kasugai, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Sep. 10, 1998, Appl. No. 150,902
Claims priority, application Japan, Sep. 12, 1997, 9-248261
Int. Cl.[7] B29D *11/00*
U.S. Cl. 264—1.7 **17 Claims**



1. A method for producing a one-piece intraocular lens comprising an optical portion composed of a first polymerization product and a supporting portion composed of a second polymerization product different from the first polymerization product, the supporting portion being formed integrally with the outer periphery of the optical portion, characterized by comprising:

a step of forming an annular supporting-portion-forming blank composed of the second polymerization product, which has a thickness to form the supporting portion for an intraocular lens and has a through hole formed by concentrically drilling the central portion on the basis of the outer diameter of the blank;

a step of forming a composite-lens-forming blank by filling in the through hole of the supporting-portion-forming blank a monomer composition for forming the first polymerization product, followed by polymerizing, whereby the first polymerization product is formed integrally in the through hole of the supporting-portion-forming blank; and

a step of forming a one-piece type intraocular lens by processing the composite-lens-forming blank on the basis of its outer diameter so that the supporting portion is formed from a portion corresponding to the supporting-portion-forming blank in the composite-lens-forming blank, and the optical portion is formed from the first polymerization product formed in the through hole, which has been drilled in the supporting-portion-forming blank, in the composite-lens-forming blank,

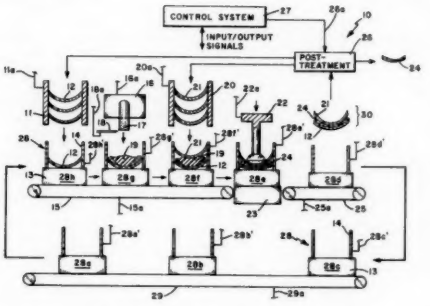
wherein the monomer composition for the first polymerization product is filled in the through hole of the supporting-portion-forming blank; opened portions at both ends of the through hole are covered with flexible films so as not to leave air between the monomer composition and the films: and the polymerization of the monomer composition is conducted.

6,015,512

EXTRUSION-COMPRESSION MOLDING OF OPTICAL ARTICLES

Zhou Yang, and Yin-Nian Lin, both of Milford, Conn., assignors to Optima Inc., Stratford, Conn.

Filed Jan. 28, 1998, Appl. No. 14,811
Int. Cl.[7] B29D *11/00*
U.S. Cl. 264—2.2 **26 Claims**



1. A method of forming an optical article comprising:

forming a melt of an optical polymeric material in a melting apparatus and feeding the melt from the apparatus in the form of an unpressurized melt strand;

providing a lower die from a lower die supply device, the lower die being part of a die set comprising a lower die and an upper die;

forming and adding a predetermined melt shot portion of the unpressurized melt strand to the upper surface of the lower die;

providing the upper die from an upper die supply device and positioning the upper die on top of the unpressurized melt shot containing lower die forming a melt containing die set;

compressing the melt containing die set forming an optical article;

removing the optical article from the die set; and

repeating the above steps until the desired number of optical articles are made.

6,015,513

METHOD OF MAKING LIPSTICK SAMPLERS

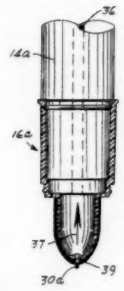
Robert J. Sheffler, Morganville, N.J., and Charles Chang, 127 E. Edsall Ave., Palisades Park, N.J. 07650, assignors to Charles Chang, Wayne, N.J.

Division of application No. 08/526,446, Sep. 11, 1995, Pat. No. 5,785,905. This application Jun. 10, 1998, Appl. No. 94,457.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B29B *17/00;* **B29C** *41/14;* **B28B** *1/38;7/18;21/46*
U.S. Cl. 264—37.18 **9 Claims**

1. A method of making a lipstick sampler using an apparatus comprising a reservoir containing molten fluid lipstick wax material, a spindle which is disposed above the reservoir and which is advanceable toward and retractable away from the reservoir, and a plastic cup-shaped form having a tip, and having an aperture in the tip comprising the steps of:

a) applying the plastic cup-shaped form onto the spindle,

b) advancing the spindle to dip the plastic cup-shaped form into the reservoir containing molten fluid lipstick wax material and submerging the tip of the plastic cup-shaped form in the molten fluid lipstick wax material contained therein for a time interval to form a coating of said molten fluid lipstick wax



material on the plastic cup-shaped form and thereby form a coated plastic cup-shaped form,

c) retracting the spindle and the coated plastic cup-shaped form from the reservoir, an excess of said molten fluid lipstick wax material forming on the tip at the aperture,

d) drawing gas inwardly through said aperture of the coated plastic cup-shaped form while said molten fluid lipstick wax material is still fluid to thereby draw said excess of said molten fluid lipstick wax material on the tip into the interior of the spindle, thereby to minimize excess accumulation of the molten fluid lipstick wax material on the tip of the plastic cup-shaped form, and

e) cooling the molten fluid lipstick wax material on the coated plastic cup-shaped form to solidify the molten fluid lipstick wax material on the coated plastic cup-shaped form.

6,015,514

METHOD AND METALLIC MOLD FOR PRODUCING MOLDED PLASTIC PRODUCTS

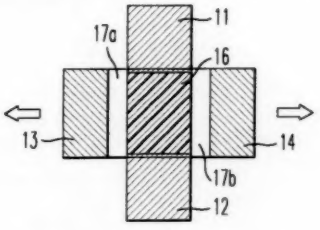
Hisaaki Koseko, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 7, 1997, Appl. No. 966,248

Claims priority, application Japan, Nov. 7, 1993, 8-294689; May 16, 1997, 9-126151; Jun. 20, 1997, 9-164316

Int. Cl.[7] **B29C** *45/56;45/73*

U.S. Cl. 264—40.1 **38 Claims**



1. A method of producing a molded plastic products comprising the steps of:

preparing a metallic mold having at least one transferring surface and at least one or more cavity pieces having at least one surface excluding said at least one transferring surface, and including at least one cavity formed therein defined by said at least one transferring surface and said at least one or more cavity pieces;

heating said metallic mold to a heating temperature lower than a softening temperature of a resin;

filling said at least one cavity with said resin when said resin is in a fused state and heated to a temperature higher than the softening temperature of said resin, by injecting said resin in said at least one cavity;

generating a pressure on said at least one transferring surface and causing said resin to adhere to said at least one transferring surface;

cooling said resin such that a first portion of said resin is cooled to a temperature lower than the softening temperature of said resin;

parting said at least one or more cavity pieces from said resin by sliding said at least one or more cavity pieces from said resin while a second portion of said resin remains at or above the softening temperature of said resin, and forcibly forming thereby an air gap between said resin and said at least one or more cavity pieces, and

opening said metallic mold and removing said resin after the second portion of the resin is cooled below the softening temperature of the resin.

6,015,515

METHOD FOR SETTING UP A PROGRAM PROFILE IN THE CONTROL OF THE INJECTION SPEED OF INJECTION MOLDING MACHINES AND AN APPARATUS THEREFOR

Shigeru Fujita, Shizuoka, Japan, assignor to Toshiba Machine Co., Ltd., Tokyo, Japan

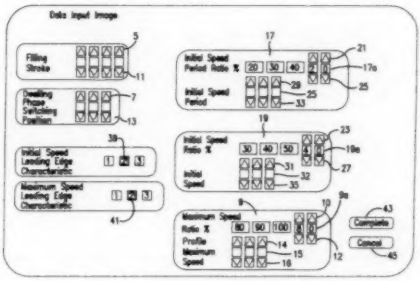
Continuation of application No. 08/622,450, Mar. 22, 1996, Pat. No. 5,914,077. This application Oct. 29, 1998, Appl. No. 182,095.

Claims priority, application Japan, Mar. 24, 1995, 7-65949

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B29C** *45/76*

U.S. Cl. 264—40.1 **22 Claims**



1. A method for setting a program profile in the control of an injection speed of injecting molding machines, in which a moving speed of an injection plunger in a forward direction such that the mold cavity will be filled is controlled by the program profile in accordance with a position of a plunger, comprising:

inputting into a profile setting means values for the following items:

a switching position of the injection plunger when an injecting phase is changed from a melt material filling phase to a dwelling phase;

one of a desired filling stroke for the injection phase and a starting position of the plunger for the injection phase;

a maximum speed of the profile;

an initial speed of the profile; and

a period during which said initial speed remains constant; and

automatically using the profile setting means to set up the program profile, wherein the program profile results in a prosecuting profile which satisfies the values input into the profile setting means.

6,015,516

ULTRATHIN HIGH-PERFORMANCE HOLLOW FIBER MEMBRANES

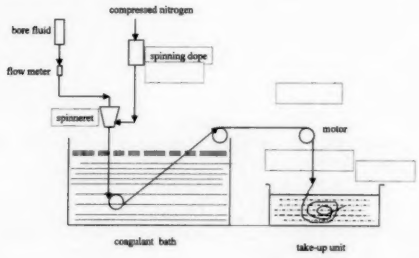
Tai-Shung Chung, Ann Arbor, Mich.; Xudong Hu, and Soo Khean Teoh, both of Singapore, Singapore, assignors to National University of Singapore, Singapore

Filed Jun. 19, 1998, Appl. No. 100,094

Claims priority, application Singapore, Jun. 16, 1998, 9801427-7

Int. Cl.[7] **D01D** *5/247*

U.S. Cl. 264—41 **13 Claims**



The Schematic Diagram of The Hollow Fiber Spinning Process

1. A process for forming ultrathin dense-layer asymmetric hollow fiber membranes comprising

a) dissolving a polymer in a solvent to form a homogenous dope possessing sufficient viscosity and exhibiting chain entanglement at the spinning temperature;

b) extruding the mixture to form an asymmetric hollow fiber membrane using water as an external coagulant and a bore fluid comprising water and a water miscible solvent; wherein the solubility parameter difference between the bore fluid and the spinning dope is less than 2.5 $(cal/cm^3)^{0.5}$, and

the volume ratio of bore-fluid flow rate to the dope flow rate ranges from 0.45 to 0.75.

6,015,517

CONTROLLED POROSITY FOR CERAMIC CONTACT SHEETS AND SETTER TILES

Jon A. Casey, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1998, Appl. No. 57,306

Int. Cl.[7] **B29C** *65/00*

U.S. Cl. 264—44 **20 Claims**

1. A method for controlling porosity in a gas permeable material comprising:

providing a refractory material slurry;

selecting a fugitive phase material having a volume percentage of said refractory material slurry, wherein said fugitive phase material can be removed during thermal processing;

combining said fugitive phase material with said slurry;

processing the combined slurry into a resultant refractory body;

heating for a period of time to thermally remove a portion of said fugitive phase material, less than said volume percentage, from said refractory body; and,

discontinuing said heating of said resultant refractory body such that a remaining portion of said fugitive phase material remains, to form a contiguous porous network with porosity approximately equal to the volume percentage of the removed portion of said fugitive phase material.

6,015,518

METHOD OF MAKING A DEVICE FOR CONDUCTING A FLUID BETWEEN A SPACE BOUNDED BY A FIXED SURFACE AND A DUCT

Theodor Hirzel, Widen, Switzerland, assignor to Unipor AG, Winterthur, Switzerland

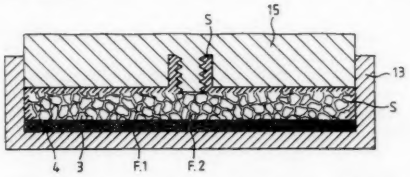
PCT No. PCT/CH95/00250, § 371 Date Jul. 15, 1997, § 102(e) Date Jul. 15, 1997, PCT Pub. No. WO96/14194, PCT Pub. Date May 17, 1996

PCT Filed Oct. 27, 1995, Appl. No. 836,439

Claims priority, application Switzerland, Nov. 2, 1994, 3269/94; Nov. 2, 1994, 3270/94

Int. Cl.[7] **B29C** *43/04;43/20*

U.S. Cl. 264—69 **5 Claims**



1. A method for manufacturing a device for conducting fluid between a duct and a space comprising the steps of p**l** providing first and second mating mold parts,

placing in the first mold part a first mixture of curable plastic and first particles of a selected size and forming a layer from the mixture using the first and second mold parts,

compacting the layer under a first compacting pressure and removing the second mold part,

providing a third mold part having molding cavities for a duct connector and matable with the first mold part,

covering the layer in the first mold part with a second mixture of curable plastic and second particles larger than the first particles,

with the first and third mold parts, compacting the second mixture with a second compacting pressure lower than the first compacting pressure,

curing the plastic,

filling the duct connector molding cavities and coating an inner surface of the third mold part, and portions of the first mold part not covered by the layer, with curable plastic, and

joining the first and third mold parts and curing the plastic to form a one-piece device.

6,015,519

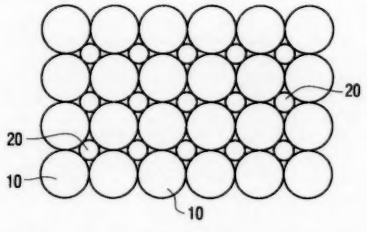
DENSIFIED COATING PROCESS AND MOLDED ARTICLES HAVING DENSIFIED OUTER SURFACE

James S. Lapikas, Sharpesville, and John B. O'Connor, Newcastle, both of Pa., assignors to Pyramid Composities Manufacturing Limited Partnership, Greenville, Pa.

Filed May 1, 1995, Appl. No. 431,611

Int. Cl.[7] **B29C** *41/08;41/22*

U.S. Cl. 264—74 **16 Claims**



1. A method for forming a molded article comprising the steps of preparing a densified coating material which contains a matrix-forming resin and a distribution of densifier particles, said distri-

bution of densifier particles comprising a large densifier particle fraction, said particles of said large densifier particle fraction having an average diameter of about 35 microns to 50 microns, and a small densifier particle fraction, said particles of said small densifier particle fraction having an average diameter of from about 8 microns to about 15 microns; wherein the average diameter of the particles of said large densifier particle fraction has a ratio to the average diameter of the particles of said small densifier particle fraction of from about 6 to 1 to about 5.5 to 1; coating a surface of a mold cavity with the densified coating material; and backfilling the mold such that the densified coating material forms a surface of the molded article.

6,015,520

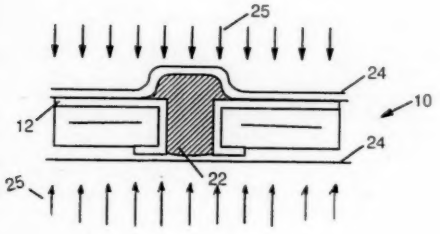
METHOD FOR FILLING HOLES IN PRINTED WIRING BOARDS

Bernd Karl-Heinz Appelt, Apalachin; Christina Marie Boyko, Endicott; Donald Seton Farquhar, Endicott; Stephen Joseph Fuerniss, Endicott, and Michael Joseph Klodowski, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1997, Appl. No. 857,188

Int. Cl.[7] B29C *35/08;37/02*

U.S. Cl. 264—104 **27 Claims**



1. A method for filling a hole in a printed wiring board (PWB), said method comprising the steps of:

forming a layer of photoimageable material on a surface of said PWB, a hole passing through said PWB, said photoimageable material covering said hole;

at least partially curing said photoimageable material in a region covering said hole; and

forcing said at least partially cured photoimageable material into said hole.

6,015,521

METHOD FOR TREATING CARBONACEOUS CONDUCTIVE MATERIAL FOR RESIN DISPERSION

Atsushi Nishiwaki, 1-11, 2-chome, Funakoshi-cho, Chuo-ku, Osaka-shi, Osaka, Japan

Division of application No. 08/581,367, Dec. 29, 1995, Pat. No. 5,686,183. This application Jul. 9, 1997, Appl. No. 890,556.

Claims priority, application Japan, Sep. 19, 1995, 7-240352

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C04B *35/00*

U.S. Cl. 264—105 **10 Claims**

1. A method of treating a carbonaceous conductive material for resin dispersion which comprises treating fine particles of a carbonaceous conductive material with an acid, mixing the resulting carbonaceous conductive material with water to remove the acid therefrom and then crushing the resulting particles in a mill to reduce the size thereof.

6,015,522

METHOD FOR LOW-TEMPERATURE PREPARATION OF ELECTRODES FROM CONDUCTING REFRACTORY POWDER MATERIALS

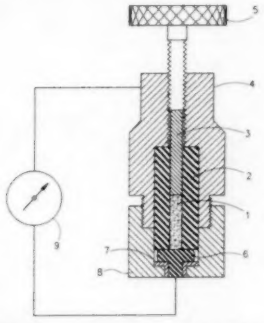
Boris Filanovsky; Tat'yana Burenko; Ilya Kuselman; David Simantov, and Avinoam Shenhar, all of Jerusalem, Israel, assignors to State of Israel, Ministry of Industry & Trade, National Physical Laboratory of Israel, Jerusalem, Israel

Filed Oct. 20, 1997, Appl. No. 953,979

Claims priority, application Israel, Oct. 20, 1996, 119448

Int. Cl.[7] C04B *35/00*

U.S. Cl. 264—105 **10 Claims**



1. A method for low-temperature preparation of electrochemical electrodes from electroconducting refractory powders which comprises:

mixing a refractory powder with an effective amount of solution of a polymer to prepare a mixture,

pressing this mixture in a disposable polymer frame with a metal puncheon in a collapsible device,

hardening the mixture under pressure to form an electrode, and cleaning and polishing the working surface of the electrode.

6,015,523

PROCESS FOR PRODUCING ELECTRONIC PARTS

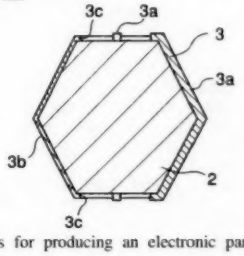
Tetsuo Yumoto, Saitama, Japan, assignor to Sankyo Kasei Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1997, Appl. No. 993,020

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B29C *33/52;59/00*

U.S. Cl. 264—129 **14 Claims**



1. A process for producing an electronic part, said process comprising:

a first molding step of injecting a polyvinyl alcohol-based resin containing an oxyalkylene group into a mold cavity corresponding to the internal configuration of the electronic part to produce a core for the injection molding, wherein said resin has a melting point lower than that of a thermoplastic resin of the electronic part and has a solubility in water so that said polyvinyl alcohol-based resin easily dissolves in hot water;

a second molding step of inserting the core into a mold cavity corresponding to the external configuration having a ridgy projection for a circuit pattern to be formed on the electronic part and thereafter injecting an aromatic polyester liquid crys-

talline polymer of a highly heat-resistant thermoplastic resin, whose surface can be roughened by an alkali and which contains a catalyst, at a predetermined pressure into the cavity to produce a second stage product which has the core inserted therein and has the circuit pattern forming area protruded as a ridge and which is provided with a discharge outlet;

a third molding step of inserting the second product into a mold cavity corresponding to the external configuration of the electronic part and thereafter injecting an alkali-resistant, highly heat-resistant thermoplastic resin into the cavity encircling the second stage product by injection molding to produce a third stage product in which the circuit pattern forming area is exposed but all other surfaces are covered with the alkali-resistant, highly heat-resistant thermoplastic resin;

a fourth molding step of immersing the third stage product in hot water under heating for dissolving away the core to thereby produce a fourth stage product;

a fifth molding step of roughening the surface of the circuit pattern forming area exposed on the external peripheral surface of the fourth stage product and metallizing the roughened area to form an electroconductive circuit.

6,015,524

ADHESIVES FOR MAKING MULTILAYER FILMS COMPRISING LIQUID CRYSTALLINE POLYMERS AND POLYETHYLENE

James E. Kuder, Fanwood; Dominick Cangiano, Neshanic; Vincent J. Provino, Clifton, and Wayne Xu, Lake-Hiawatha, all of N.J., assignors to Hoechst Celanese Corporation, Warren, N.J.

Filed Oct. 20, 1997, Appl. No. 954,377

Int. Cl.[7] B29C *47/06*

U.S. Cl. 264—173.12 **13 Claims**

1. A method of laminating a thermotropic liquid crystalline polymer film and a polyethylene film together, wherein said thermotropic liquid crystalline polymer film and said polyethylene film are heated under a compressive force with a hot melt adhesive between said thermotropic liquid crystalline polymer film and said polyethylene film to a temperature above the melting points of said thermotropic liquid crystalline polymer film, said polyethylene film, and said hot melt adhesive for a time sufficient to melt said hot melt adhesive and bind said polyethylene film and said thermotropic liquid crystalline polymer film to one another to yield a laminated film, wherein said hot melt adhesive is a polyolefin blend comprising isotactic polypropylene, a substantially amorphous second poly(α-olefin), and an oligomer of a third α-olefin which has at least 8 carbon atoms in the α-olefin monomer.

6,015,525

TIRE CURE BLADDER COMPOSITION WITH ALKYLPHENOXYPOLY (ALKYLENEOXY) ALKANOL

George Philemon Patitsas, Kent, and Paul Harry Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 3, 1998, Appl. No. 145,931

Int. Cl.[7] B29C *35/00;* **C08F** *210/08*

U.S. Cl. 264—315 **11 Claims**

1. In a curing press for a rubber composition which uses an expandable bladder to assist in shaping and curing said rubber composition, wherein the bladder is made from crosslinking a rubber formulation including

one or more crosslinkable rubbery polymers, wherein at least 50 weight percent of said rubbery polymers of said bladder are at least one isobutylene rubbery polymer having at least 80 weight percent repeating units from isobutylene;

one or more curatives for said one or more rubbery polymers;

the improvement wherein the bladder further comprises from about 2 to about 15 parts by weight of a mono or poly(alkyl)phenoxypoly(alkyleneoxy)alkanol dispersed throughout said bladder, and

wherein said parts by weight are based on 100 parts by weight of said rubbery polymers in the rubber bladder formulation.

6,015,526

VERTICAL ANNEALING FURNACE FOR A STRIP TREATMENT DEVICE

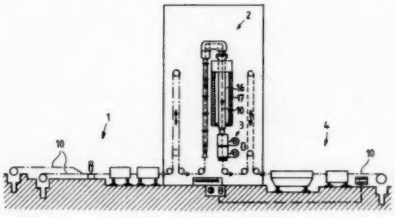
Leo Antonius Ruiter, Krimpen a/d IJssel, Netherlands, assignor to Thermtec B.V., Rotterdam, Netherlands

Continuation of application No. PCT/NL97/00181, Apr. 9, 1997. This application Oct. 13, 1998, Appl. No. 170,522.

Claims priority, application Netherlands, Apr. 12, 1996, 1002856

Int. Cl.[7] C21D *9/54*

U.S. Cl. 266—108 **10 Claims**



1. Vertical annealing furnace for the continuous bright annealing of a metal strip guided through said furnace, comprising:

a vertically disposed muffle having a strip entry side and a strip exit side, said muffle having the freedom to expand in a longitudinal direction, and said muffle being disposed such that said strip entry side is situated at a top side of said muffle and said strip exit side is situated at an underside of said muffle;

heating means for externally heating said muffle;

bearing means for fixedly supporting the underside of said muffle such that it is delimited downwards in the longitudinal direction;

an expansion section being provided on the top side of said muffle for taking up thermal expansion in the longitudinal direction of generally said entire muffle; and

vertically movable support means for exerting an upwardly directed support force on said muffle, said vertically movable support means being connected to an upper part of said muffle.

6,015,527

FACILITY FOR PRODUCING REDUCED IRON

Yasuo Kamei, Narashino; Takazo Kawaguchi, Katori-gun; Hideyuki Yamaoka, Namekata-gun, and Yoshihisa Nakamura, Takatsuki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation of application No. PCT/JP97/04091, Nov. 10, 1997. This application Jul. 9, 1998, Appl. No. 112,359.

Claims priority, application Japan, Nov. 11, 1996, 8-314316; Dec. 10, 1996, 8-329950

Int. Cl.[7] C21B *13/08*

U.S. Cl. 266—145 **11 Claims**

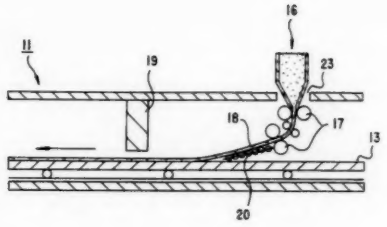
1. A facility for production of reduced iron, comprising:

a mixer for mixing fine iron oxides with powdery solid reductants;

a compactor for compacting a raw material mixture obtained through the mixing step into a sheet-like compact;

a feeder for placing the sheet-like compact on the hearth of the reduction furnace; and

a reduction furnace for reducing the iron oxides contained in the sheet-like compact fed therein, said reduction furnace being a rotary hearth furnace and comprising:



a furnace body provided with a feeding inlet for the sheet-like compacts, a discharge outlet for the reduced iron produced through high temperature reduction of the iron oxides, and an exhaust outlet for off-gas generated therein,

a hearth installed therein so as to be horizontally rotatable, and

burners for combusting the fuel after the fuel and the oxygen-containing gas are blown in,

wherein the compactor is a double-roll compactor disposed above the hearth such that axes of the double rolls intersect the direction of advance of the hearth at right angles, and the feeder of the sheet-like compact is a feeder chute.

6,015,528

APPARATUS AND PROCESS FOR CASTING METAL MATRIX COMPOSITE MATERIALS

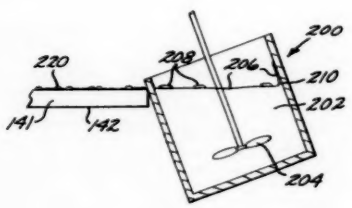
Richard S. Bruski, Encinitas, Calif.; Larry G. Hudson, Pulaski, N.Y.; Iljoon Jin; David J. Lloyd, both of Kingston, Canada, and Michael D. Skibo, Leucadia, Calif., assignors to Alcan International Limited, Montreal, Canada

Continuation of application No. 08/223,747, Apr. 5, 1994, abandoned, which is a continuation of application No. 07/553,111, Jul. 13, 1990, Pat. No. 5,299,724. This application Mar. 4, 1996, Appl. No. 610,671.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C22C** *1/10;* **B22D** *11/00;19/14*

U.S. Cl. 266—207 **17 Claims**



1. A process for preparing a solid cast composite material, comprising the steps of:

furnishing a mixture of molten metal and solid, free flowing reinforcement particles occupying from about 5 to about 35 percent of the volume of the mixture, the step of furnishing including a step of wetting the molten metal to the particles under conditions that the particles are distributed throughout the volume of the melt;

conveying the mixture of molten metal and particles from a mixing apparatus to a solidification apparatus; and

solidifying the mixture in the solidification apparatus at a cooling rate of at least about 15° C. per second between the liquidus and the solidus temperatures of the molten metal.

6,015,529

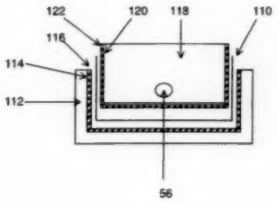
TRAY/CONTAINER SYSTEM FOR CLEANING/ STERILIZATION PROCESSES

Szu-Min Lin, Laguna Hills, and Paul Taylor Jacobs, Trabuco Canyon, both of Calif., assignors to Johnson & Johnson Medical, Inc., New Brunswick, N.J.

Filed Dec. 17, 1997, Appl. No. 992,681

Int. Cl.[7] **A61L** *2/18*

U.S. Cl. 422—28 **28 Claims**



1. A method for cleaning and sterilizing or disinfecting a medical device with a lumen having at least two open ends comprising the steps of:

a) providing a container having at least one enclosure and at least one openable and closeable interface separating said container and said enclosure;

b) placing said device on a tray;

c) placing said tray into said container and said enclosure so that one end of said device and a portion of said tray are located in said container and the other end of said device and another portion of said tray are located in said enclosure;

d) creating a pressure difference between the two ends to generate a flow through the lumen of said device;

e) cleaning said device with a cleaning solution;

f) rinsing said device with a rinse solution;

g) treating said device with a chemical germicide.

6,015,530

GENERAL APPLICABLE TOPICAL GERMICIDE

Joseph A. Porcello, 2600 S. Ocean Blvd., A-3, Boca Raton, Fla. 33432

Continuation-in-part of application No. 08/593,615, Jan. 30, 1996. This application Dec. 30, 1997, Appl. No. 1,128.

Int. Cl.[7] **A01N** *59/12*

U.S. Cl. 422—37 **20 Claims**

1. A method for disinfecting a dermal or mucous membrane surface comprising the steps of providing a composition which is stingless, stainless, and non-irritative to skin or clothing, said composition consisting essentially of, by volume of the total composition; about one volume units phenol; about one volume units 7% tincture of iodine solution; and about four to about eight volume units glycerin; and

applying to said surface an effective amount of said composition.

6,015,531

SINGLE-USE ANALYSIS CARD COMPRISING A LIQUID FLOW DUCT

Bruno Colin, Marcy l'Etoile; Cécile Jaravel, and Philippe Cleuziat, both of Lyons, all of France, assignors to Bio Merieux, Marcy l'Etoile, France

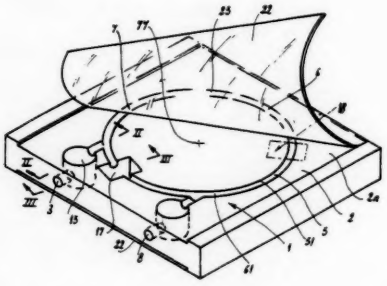
PCT No. PCT/FR97/01020, § 371 Date Mar. 5, 1998, § 102(e) Date Mar. 5, 1998, PCT Pub. No. WO97/46318, PCT Pub. Date Dec. 11, 1997

PCT Filed Jun. 9, 1997, Appl. No. 983,492

Claims priority, application France, Jun. 7, 1996, 96 07381

Int. Cl.[7] B01L *3/00; G01N 21/00*

U.S. Cl. 422—58 **25 Claims**



1. Analysis device (**1**) comprising a body (**2**) in which the following are arranged or formed:

an orifice (**3**) for introducing an initial liquid sample,

a liquid flow circuit (**5**), comprising at least one operating compartment (**6**) for a treated liquid sample, obtained with all or some of the initial sample, communicating with said introduction orifice (**3**), said flow circuit describing, in at least two dimensions of the card, a determined geometrical line such that any change in the orientation of the card in a three-dimensional frame, including a vertical reference dimension, causes the liquid to flow solely under gravity from one section of said circuit to another, for example from one side or the other with the operating compartment (**6**), wherein said liquid flow circuit further comprises an observation chamber, and wherein said obseravation chamber is a means for providing qualitative and/or quantitative information on the liquid in said analysis device, said observation chamber further being either one of the same as said operating compartment and spaced from said operating compartment,

characterized in that the flow circuit (**5**) is continuous and looped on itself between said introduction orifice (**3**) and said operating compartment (**6**).

6,015,532

INCUBATION VESSEL SUPPORT

John A. Clements, Wallington; Ronald F. Jay, Cobham, and Paul M. Kemp, Aldershot, all of United Kingdom, assignors to Alfa Biotech S.p.A., Italy

PCT No. PCT/GB95/01798, § 371 Date May 1, 1997, § 102(e) Date May 1, 1997, PCT Pub. No. WO96/03658, PCT Pub. Date Feb. 8, 1996

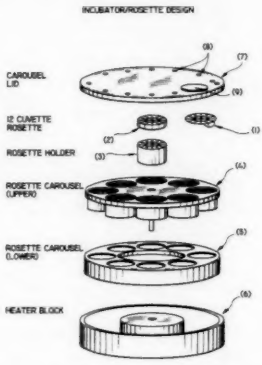
PCT Filed Jul. 27, 1995, Appl. No. 776,406

Claims priority, application United Kingdom, Jul. 28, 1994, 9415232

Int. Cl.[7] G01N *35/02*

U.S. Cl. 422—64 **10 Claims**

1. An incubation vessel supporting apparatus, comprising a moveable support and a plurality of incubation vessel mountings carried by said support and moveable independently from one another and relative to said support such that, in use, each of said plurality of vessel mountings is simultaneously independently



moveable so that each said vessel mounted by said mountings is capable of movement to achieve substantially the same temperature/time integral.

6,015,533

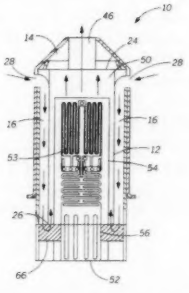
SENSOR HOUSING FOR A CALORIMETRIC GAS SENSOR

Daniel A. Young, Gurnee, Ill.; Neil J. Adams, Novi, Mich., and Armand Losinski, Albuquerque, N. Mex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 14, 1997, Appl. No. 970,698

Int. Cl.[7] G01N *7/00*

U.S. Cl. 422—83 **7 Claims**



1. A sensor housing for directing flow of a gas from an external gas stream over a sensing device comprising:

an outer tube longitudinally extending about an axis and having an interior surface and an exterior surface and having a first end opposite a second end;

an inner tube insertably mounted within the outer tube and longitudinally extending about the axis, the inner tube having an interior surface and an exterior surface and having a first end opposite a second end;

a sensing device positioned within the inner tube; a coupling structure closing the first end of the outer tube and the first end of the inner tube to gas flow;

a plurality of flutes on the exterior surface of the inner tube; and

a plurality of inlet orifices in the outer tube extending from the interior surface of the outer tube to the exterior surface of the outer tube and an outlet orifice at the second end of the outer tube extending from the interior surface of the outer tube to the exterior surface of the outer tube,

wherein each of the plurality of flutes on the exterior surface of the inner tube is arranged in spaced relationship with one or more of the plurality of inlet orifices in the outer tube,

wherein the outlet orifice at the second end of the outer tube communicates with the sensing device, and

wherein a recessed region of the interior and exterior surface of the outer tube surrounds selected ones of the plurality of inlet orifices in the outer tube, such that the recessed regions engage selected ones of the plurality of flutes in the exterior surface of the inner tube.

6,015,534

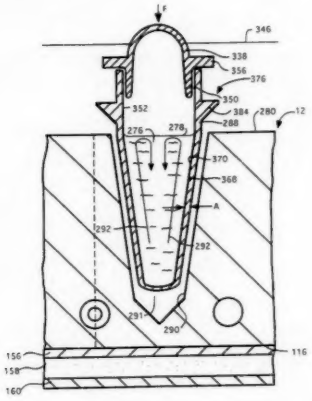
PCR SAMPLE TUBE

John Girdner Atwood, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of application No. 08/201,859, Mar. 8, 1994, abandoned, which is a division of application No. 07/871,264, Apr. 20, 1992, Pat. No. 5,475,610, which is a continuation-in-part of application No. 07/670,545, Mar. 14, 1991, abandoned, which is a continuation-in-part of application No. 07/620,606, Nov. 29, 1990, abandoned. This application Apr. 14, 1995, Appl. No. 422,740.

Int. Cl.[7] B01L *3/00*

U.S. Cl. 422—102 **3 Claims**



1. In combination, a one-piece sample tube for use in a PCR thermal cycler comprising, a first substantially cylindrically shaped upper wall section, said upper wall section having an external shoulder molded around the entire circumference of the section; the lower surface of said shoulder being conically beveled, a portion of said upper wall section being above said shoulder and having a thickness of about 0.022 inches, and a portion of said wall section being below said shoulder and having a thickness of about 0.015 inches, said sample tube comprising a second lower wall section having a frustrum of a cone shape with an included angle of about 17 degrees, said lower wall section having a thickness of 0.009 inches, said second section having a volume for holding about 100 microliters of liquid, said tube being compliant and being made from polypropylene and being autoclavable; and a one-pieced cap pivotally attached to said tube and removably insertable into said tube to hermetically seal said tube, said cap comprising a substantially cylindrically shaped third lower section, a resiliently deformable closed dome shaped fourth top section extending upward from said third lower section, and a circumferential shoulder, extending radially outwardly, attached to and interposed between said third and fourth sections.

6,015,535

PROCESS FOR PRODUCING PURIFIED CESIUM COMPOUND FROM CESIUM ALUM

Patrick M. Brown, Exton; Michael C. Northrup, Boyertown, and Bart F. Bakke, Sellersville, all of Pa., assignors to Cabot Corporation, Boston, Mass.

Continuation of application No. 08/417,562, Apr. 6, 1995, abandoned. This application May 19, 1997, Appl. No. 858,758.

Int. Cl.[7] C01D *17/00*

U.S. Cl. 423—179 **7 Claims**

1. A process comprising treating cesium alum with slaked lime or calcium carbonate and an acid or a salt of said acid to produce a cesium salt of said acid, wherein said cesium salt includes calcium ions and sulfate ions as impurities; and adding barium hydroxide to a solution of said cesium salt in an amount sufficient to precipitate sulfate ion containing compounds to provide a cesium salt having less than 0.50 percent by weight of sulfate ion.

6,015,536

PEROXYACID COMPOUND USE IN ODOR REDUCTION

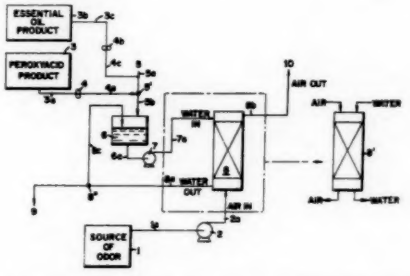
Keith D. Lokkesmoe, Savage, Minn.; Robert D. Hei, Baldwin, Wis., and Joel J. Schilling, South St. Paul, Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Jan. 14, 1998, Appl. No. 7,225

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B01J *8/00*

U.S. Cl. 423—210 **23 Claims**



1. A process for removing an odor from an atmospheric effluent, the process comprising:

(a) contacting an atmospheric effluent comprising an odor component with an aqueous peracid treatment composition, forming an oxidized odor component and dissolving the oxidized odor component or an odor component in the aqueous treatment composition to form an aqueous treatment composition containing the odor or oxidized odor and an effluent with reduced odor;

(b) removing at least a portion of the aqueous treatment composition containing the odor or oxidized odor; and

(c) returning the effluent with reduced odor to the atmosphere.

6,015,537

PROCESS AND REACTOR FOR THE PREPARATION OF AMMONIA

Erik Andreas Gam, Hørsholm, Denmark, assignor to Haldor Topsoe A/S, Lyngby, Denmark

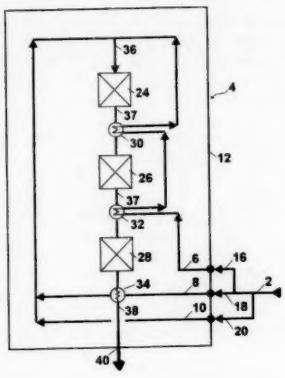
Filed Apr. 14, 1998, Appl. No. 60,541

Claims priority, application Denmark, Apr. 21, 1997, 0444/97

Int. Cl.[7] C01C *1/04;1/00*

U.S. Cl. 423—360 **2 Claims**

1. Process for the preparation of ammonia at elevated pressure and temperature in an ammonia reactor, comprising passing a process stream of ammonia synthesis gas successively through at least three catalyst beds and reacting the synthesis gas in the beds;



intermediately cooling of partially reacted synthesis gas leaving the catalyst beds by heat exchange in heat exchangers arranged between each catalyst bed and withdrawing a product effluent being rich in ammonia, wherein the process stream is obtained by combining prior to introduction into a first catalyst bed, a first feed stream of synthesis gas having been preheated through indirect heat exchange during the intermediate cooling of the partially converted synthesis gas, a second feed stream of synthesis gas having been preheated by indirect heat exchange with the product effluent, and a third feed stream of synthesis gas for adjustment of temperature of the process stream and wherein the first feed stream is passed successively through the interbed heat exchangers for cooling the partially converted synthesis gas.

2. Ammonia reactor comprising within a cylindrical pressure shell at least a first, a second and a last catalyst bed vertically arranged around a common axis and connected in series;

intermediate heat exchanging means arranged between each catalyst bed for intermediate cooling of a partially converted ammonia synthesis gas from the catalyst bed by indirect heat exchange with a first feed stream of fresh ammonia synthesis gas;

feed-effluent heat exchanging means arranged at outlet of the last catalyst bed for cooling of an ammonia product effluent stream by indirect heat exchange with a second feed stream of ammonia synthesis gas;

inlet means for introducing the first feed stream and inlet means for introducing the second feed stream into the reactor;

inlet means for introducing a third feed stream of fresh ammonia synthesis gas into the reactor;

means for passing the first, the second and the third feed stream to the top catalyst bed; and

means for combining the feed streams to a process stream prior to introduction of the process stream into the top catalyst bed,

wherein the means for passing the first feed stream consists of a passage-way for connecting in series the intermediate heat exchangers and for passing the first stream from the inlet means consecutively through the intermediate heat exchanging means to the means for combining the feed streams.

6,015,538

METHODS FOR DOPING AND COATING NICKEL HYDROXIDE

Juraj Babjak; Victor Alexander Ettel, both of Mississauga, and Stephen Joseph Baksa, Oakville, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Jun. 16, 1998, Appl. No. 98,407

Int. Cl.[7] **C01B** *13/36;* **C01G** *53/04*

U.S. Cl. 423—592 **18 Claims**

1. A process for precipitating additives with nickel hydroxide comprising the steps of:

a) providing an aqueous ammonia solution containing nickel hydroxide seeds;

b) introducing at least one metallic additive into said aqueous solution to create an aqueous slurry having a reducing potential, said additive being selected from the group consisting of aluminum, cadmium, cobalt, indium, iron, manganese and zinc;

c) introducing oxygen into said aqueous slurry at a rate that maintains said reducing potential of said aqueous slurry; and

d) dissolving said at least one additive into said aqueous solution in excess of the solubility limit of said aqueous solution to precipitate the additive in the form of a hydroxide on said nickel hydroxide seeds.

6,015,539

FLUIDIZED BED PROCESS FOR PRODUCING ALUMINA FROM ALUMINUM HYDROXIDE

Hans Werner Schmidt; Martin Rahn, both of Frankfurt am Main; Werner Stockhausen, Bad Vilbel; Dietrich Werner, Messel, and Martin Hirsch, Friedrichsdorf, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

PCT No. PCT/EP96/04764, § 371 Date Sep. 3, 1998, § 102(e) Date Sep. 3, 1998, PCT Pub. No. WO97/18165, PCT Pub. Date May 22, 1997

PCT Filed Nov. 2, 1996, Appl. No. 68,758

Claims priority, application Germany, Nov. 14, 1995, 195 42 309

Int. Cl.[7] **C01F** *7/02*

U.S. Cl. 423—625 **4 Claims**

1. A process for preparing anhydrous alumina from aluminum hydroxide which comprises the steps of:

(a) feeding aluminum hydroxide into a first suspension preheater and contacting the aluminum hydroxide therein with a hot exhaust gas to partially dehydrate the aluminum hydroxide, transporting the partially dehydrated aluminum hydroxide with said exhaust gas to a first separating means and separately withdrawing from said first separating means the exhaust gas and the partially dehydrated aluminum hydroxide, dividing the partially dehydrated aluminum hydroxide into a first and second partial stream of solids, said first partial stream of solids amounting to 10 to 25% by weight of the aluminum hydroxide leaving the first suspension preheater;

(b) providing a circulating fluidized bed system comprising a fluidized bed reactor, supplied with fuel and with air as a fluidizing gas, a recycle separator connected to the upper portion of said fluidized bed reactor, and a return line for leading solids from said recycle separator to the lower portion of said fluidized bed reactor;

(c) feeding said second partial stream of solids into a second suspension preheater and contacting said second partial stream of solids therein with hot exhaust gas from said recycle separator connected to said fluidized bed reactor, transporting the solids and the exhaust gas from the second suspension preheater to a second separating means and separately withdrawing from said second separating means an exhaust gas stream which is fed into the first suspension preheater and an at least partially dehydrated solids stream which is fed into the fluidized bed reactor, combusting said fuel in said fluidized bed reactor, and adjusting the temperature in said fluidized bed reactor in a range of 850 to 1000° C.;

(d) withdrawing a third partial stream of solids from the solids being separated in the recycle separator and mixing said third partial stream of solids with said first partial stream of solids for at least 2 minutes to form a hot solids mixture; and

(e) feeding said hot solids mixture formed in step (d) into a multi-stage suspension cooler and therein cooling said hot solids mixture in direct contact with air, withdrawing air from said multi-stage suspension cooler and feeding the air into the

fluidized bed reactor as secondary air, then indirectly cooling said hot solids mixture with air in at least one fluidized bed cooler and feeding the air from the fluidized bed cooler into said fluidized bed reactor as said fluidizing gas, and withdrawing anhydrous alumina from said fluidized bed cooler.

6,015,540

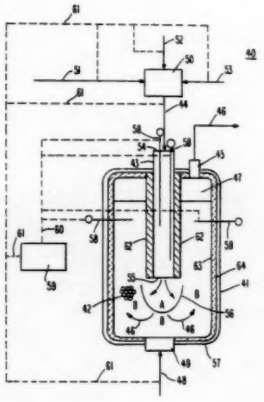
METHOD AND APPARATUS FOR THERMALLY REACTING CHEMICALS IN A MATRIX BED

Stephen R. McAdams, San Ramon; Bradley L. Edgar, Berkeley; Richard J. Martin, San Jose; Marvin M. Kilgo, Pasadena, all of Calif.; Christopher B. Baer, Knoxville, Tenn., and John D. Stilger, San Jose, Calif., assignors to Thermatrix, Inc., San Jose, Calif.

Filed Sep. 2, 1997, Appl. No. 922,189

Int. Cl.[7] **C01B** *11/00;* **B01J** *8/00;* **F23B** *5/20;* **F23D** *11/44*

U.S. Cl. 423—659 **42 Claims**



1. A method of reacting one or more chemicals in a vessel having a matrix bed of porous inert media comprising the steps of:

a) forming a process stream comprising the chemicals;

b) heating at least a portion of the matrix bed to at least the reaction temperature of the one or more chemicals;

c) feeding the process stream into the vessel through one or more feed tubes extending into the matrix bed, wherein each of the feed tubes has an entrance end, an exit end, an interior surface, and an exterior surface, and wherein the vessel has interior surfaces, an entrance side for receiving the feed tubes, an end side opposite to the entrance side, and an exhaust outlet;

d) directing the process stream through the feed tubes and into the matrix bed, wherein the process stream exiting the feed tubes is homogeneous and at a temperature below the reaction temperature of the one or more chemicals;

e) establishing and maintaining at least one non-planar reaction wave in the matrix bed, wherein at least a portion of the chemicals are reacted in the non-planar reaction wave to form a reacted process stream and heat and the heat from the non-planar reaction wave maintains the interior surfaces of the vessel at a temperature of at least about 175° F. during operation of the vessel; and

f) directing the reacted process stream, countercurrent to the flow of the process stream in the feed tubes, through the matrix bed and into the exhaust outlet of the vessel.

6,015,541

RADIOACTIVE EMBOLIZING COMPOSITIONS

Richard J. Greff, St. Pete Beach, Fla., and George Wallace, Coto de Caza, Calif., assignors to Micro Therapeutics, Inc., Irvine, Calif.

Filed Nov. 3, 1997, Appl. No. 962,819

Int. Cl.[7] **A61K** *51/12*

U.S. Cl. 424—1.25 **23 Claims**

1. A composition suitable for treating a solid mass tumor in a mammal which composition comprises:

(a) a non-crosslinked, biocompatible, non-biodegradable polymer which polymer is insoluble in blood;

(b) a biocompatible solvent which is an organic material liquid at least at body temperature of the mammal and which solubilizes said polymer with the proviso that when said solvent comprises water, the amount of water employed is sufficiently small that the dissolved polymer precipitates upon contact with the blood; and

(c) from about 0.1 to about 25 weight percent of a water insoluble radioisotope having from a radioactive content of from about 0.5 microcurie to about 100 millicuries with the proviso that when theradioisotope is either water soluble or water reactable, said isotope is used as a water insoluble salt.

6,015,542

RADIOIMMUNOTHERAPY OF LYMPHOMA USING ANTI-CD20 ANTIBODIES

Mark S. Kaminski, Ann Arbor, Mich.; Gregory M. Butchko, Miami Lakes; Stephan D. Glenn, Davie, both of Fla., and Richard L. Wahl, Ann Arbor, Mich., assignors to Coulter Pharmaceutical, Inc., South San Francisco, Calif., and The Regents of the University of Michigan, Ann Arbor, Mich.

Division of application No. 08/121,282, Sep. 16, 1993, Pat. No. 5,595,721. This application Sep. 10, 1996, Appl. No. 711,527.

Int. Cl.[7] **A61K** *51/10;39/395;* **C07K** *16/00*

U.S. Cl. 424—1.49 **12 Claims**

1. A composition comprising:

(1) a radioactively labelled monoclonal antibody or radioactively labelled monoclonal antibody fragment in an amount providing 1 to 200 mCi of radioactivity and providing irradiation in a dose range of 10 to 200 cGy to the whole body of a human patient, said amount being effective for achieving remission of B-cell lymphoma in the patient, wherein said antibody or said antibody fragment binds to CD20 antigen present on the surface of cells of B-cell lymphoma and wherein the amount of radioactivity that labels the antibody or antibody fragment is less than the amount which causes myelosuppression severe enough to require the reintroduction of hematopoietic stem cells into said patient in order for the patient to recover hematopoietic function, and

(2) a pharmaceutically acceptable carrier.

6,015,543

BENZAMIDE COMPOUNDS CONTAINING A HETEROCYCLIC RING FOR TUMOR IMAGING AND THERAPY

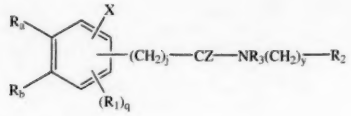
Christy S. John, Gaithersburg; Jesse Baumgold, Bethesda; John G. McAfee, Chevy Chase; Terry Moody, Germantown, and Wayne Bowen, Derwood, all of Md., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of application No. 08/426,366, Apr. 21, 1995, Pat. No. 5,911,970, which is a continuation-in-part of application No. 08/058,628, May 6, 1993, abandoned. This application Jun. 6, 1995, Appl. No. 470,847.

Int. Cl.[7] **A61K** *51/04;* **C07D** *211/00;207/08*

U.S. Cl. 424—1.81 **89 Claims**

1. A method for diagnosing a mammal for the presence of a mammalian tumor which comprises administering to a mammal a diagnostic imaging effective amount of a compound of the formula:



wherein:

X is a radionuclide;

Z is =O;

each R_1 is independently H, halo, lower alkyl, lower alkoxy;

R_a and R_b are independently H, halo, lower alkyl, lower alkoxy;

R_2 is an N-linked 5 to 7 membered monocyclic nitrogen containing heterocyclic ring which has zero or up to two oxygen ring atoms, which heterocyclic ring is unsubstituted or substituted with at least one alkyl or substituted or unsubstituted arylalkyl substituent, said alkyl containing 1–6 carbon atoms, said nitrogen containing heterocyclic ring having up to seven ring atoms including 2–6 ring carbon atoms and 1–3 ring heteroatoms of which at least one is nitrogen, said arylalkyl unsubstituted or substituted with a halogen, alkoxy or alkyl group;

each R_3 is independently hydrogen or lower alkyl;

j and y are independently an integer from 0 to 6;

q is an integer from 0 to 2

and detecting binding of said compound to a tumor in said mammal.

6,015,544

PROCESS FOR PRODUCING RADIOLABELLED BENZODIAZEPINE RECEPTOR AGENTS AND COMPOSITION CONTAINING THE SAME

Christian Foged, Målov, Denmark; Christer Halldin, Stockholm, Sweden; Jukka Hiltunen, Tikkakoski, Finland, and Lars Farde, Stockholm, Sweden, assignors to Map Medical Technologies Oy, Tikkakoski, Finland

PCT No. PCT/FI97/00177, § 371 Date Sep. 11, 1998, § 102(e) Date Sep. 11, 1998, PCT Pub. No. WO97/34898, PCT Pub. Date Sep. 25, 1997

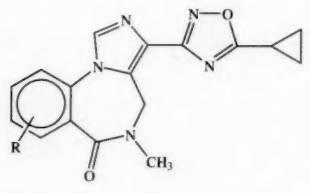
PCT Filed Mar. 18, 1997, Appl. No. 101,826

Claims priority, application Finland, Mar. 18, 1996, 961246

Int. Cl.[7] **A61K** *51/00;* **A61M** *36/14*

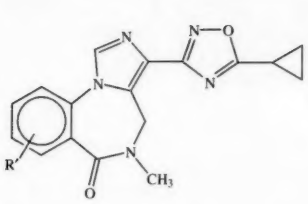
U.S. Cl. 424—1.85 **18 Claims**

1. A process for producing a radiohalogenated 3-(5-cyclopropyl-1,2,4-oxadiazol-3-yl)-5,6-dihydro-5-methyl-6-oxo-4H-imidazo[1,5-a][1,4]-benzodiazepine wherein a precursor of the general formula (I)



(I)

wherein R is bromine or iodine and R is a 7, 8, 9, or 10 substituent, is converted into a radiohalogenated 3-(5-cyclopropyl-1,2,4-oxadiazol-3-yl)-5,6-dihydro-5-methyl-6-oxo-4 H-imidazo[1,5-a][1,4]-benzodiazepine of the general formula



(II)

wherein R^1 is a radioactive halogen, selected from radioactive iodine, radioactive bromine, radioactive fluorine and R is a 7, 8, 9 or 10 substituent, by performing a radiohalogenization reaction comprising exchanging the inactive halogen of the precursor (I) into a radioactive halogen at an elevated temperature in a halogen-free acidic medium. whereafter the end product (II) is separated from the precursor (I) by using chromatographic methods.

6,015,545

MANGANESE CONTAINING MAGNETIC RESONANCE CONTRAST AGENT

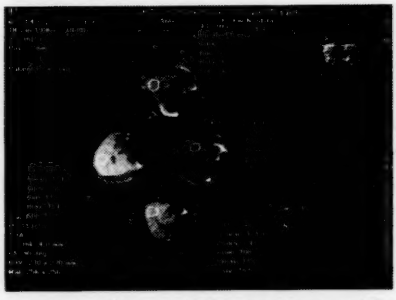
Henrik S. Thomsen, Ved Orehoj 6, DK-2900 Hellerup, Denmark

Filed Jul. 9, 1996, Appl. No. 677,051

Claims priority, application Denmark, Jul. 11, 1995, 0810/95

Int. Cl.[7] **A61K** *5/055*

U.S. Cl. 424—9.36 **20 Claims**



1. A contrast medium composition consisting essentially of a physiologically acceptable manganese compound, a vitamin D, and a physiologically acceptable amino acid or a salt thereof; the contrast medium producing contrast for magnetic resonance imaging upon administration to a patient in need of magnetic resonance imaging.

6,015,546

PREPARATION OF FURTHER DIAGNOSTIC AGENTS

Andrew Derek Sutton, Ruddington, and Richard Alan Johnson, West Bridgford, both of United Kingdom, assignors to Quadrant Healthcare (UK) Limited, Nottingham, United Kingdom

Continuation-in-part of application No. 08/411,815, filed as application No. PCT/GB93/02091, Oct. 8, 1993. This application Jun. 5, 1995, Appl. No. 465,621.

Claims priority, application United Kingdom, Oct. 10, 1992, 9221329

Int. Cl.[7] **A61K** *49/04;9/50;* **B01J** *13/02*

U.S. Cl. 424—9.52 **9 Claims**

1. A process comprising the step of atomizing a solution or dispersion of a proteinaceous wall-forming material in a liquid carrier into a gas in order to obtain gas- or vapor-filled microcapsules by evaporation of the liquid carrier, wherein said microcap-

sules comprise a poloxamer which, following introduction into the human bloodstream, directs said microcapsules away from the reticulo-endothelial system and/or reduces opsonization of said microcapsules, such that said microcapsules have an in vivo $t_{1/2}$ of at least 5 minutes in the blood or in tissue perfused by the blood.

6,015,547

STABLE SOLUTION OF ZINC IONS AND BICARBONATE AND/OR CARBONATE IONS

Benny S. Yam, Holmdel, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Continuation-in-part of application No. 08/957,904, Oct. 27, 1997, Pat. No. 5,855,873. This application Dec. 29, 1998, Appl. No. 222,101.

Int. Cl.[7] **A61K** *7/16;7/36;31/315;33/30*

U.S. Cl. 424—49 **20 Claims**

1. A storage clarity-stable aqueous or aqueous/alcoholic solution of zinc ions in the presence of at least one of bicarbonate and carbonate ions comprising:

(a) a zinc salt of a first anion which salt is selected from the group consisting of

(i) salts of zinc with one or more of said first anion, including mixed first anion salts thereof, said first anion being selected from the group consisting of

(1) chloride, sulfate, monophosphate, pyrophosphate, metaphosphate, tripolyphosphate, tettametaphosphate, orthophosphate, and

(2) organic carboxylic acid anions selected from the group consisting of gluconate, tartrate, fumarate, maleate, malonate, malate, lactate, citrate, EDTA, citraconate, citramalate, stearate, oleate, laurate, octoate ascorbate, picolinate, and orotate, and

(ii) salts of mixed alkali metal zinc or mixed magnesium zinc with said first anion;

(b) a salt of a first metal and a second anion; said first metal being selected from the group consisting of alkali metals and magnesium; and said second anion being selected from the group consisting of

(i) carboxylic acids selected from the group consisting of tartrate, funarate, maleate, malonate, malate, citraconate, citramalate, lactate, citrate, and EDTA, and

(ii) phosphates selected from the group consisting of pyrophosphate and tripolyphosphate;

(c) at least one compound selected from the group consisting of alkali metal bicarbonates, alkali metal carbonates, magnesium bicaarbonate, and magnesium carbonate;

(d) a solvent therefor, said solvent comprising:

(i) a major proportion of water;

(ii) optionally a minor amount of a lower alkyl monohydric alcohol; and

(iii) optionally a minor amount of a humectant having at least 3 hydroxy groups;

(e) optionally one or more acceptable antibacterial agents;

(f) optionally one or more acceptable viscosity enhancers;

(g) optionally one or more sweeteners;

(h) optionally one of more flavors;

(i) optionally one or more colors; and

(j) optionally one or more acceptable fragrances;

said zinc salt being present in an amount A sufficient to yield a zinc ion concentration of from about 0.01 to about 2 weight %;

said salt of said second anion present in an amount B, which in combination with any of said second anion present from other components of said solution, is sufficient to provide a total second anion concentration of at least 1.2 equivalents per equivalent of zinc ion;

said compound being present in an amount of C equivalents, which is no greater than the sum of

(a) (6)×(the number of equivalents of said pyrophosphate and tripolyphosphate); and

(b) $\{(3^{(n-1)})/(2^m)\}$×(the number of equivalents of said second anions which are carboxylic acids), where n is the number of carboxyl groups and m is the number of basic nitrogens;

whereby the interaction of solubilized zinc ions and solubilized bicarbonate and carbonate ions to form insoluble zinc carbonate(s) is substantially reduced relative to that which would occur in the same formulation in the absence of said second anion in the amounts set forth above.

6,015,548

HIGH EFFICIENCY SKIN PROTECTION FORMULATION WITH SUNSCREEN AGENTS AND ANTIOXIDANTS

Mukhtar Siddiqui, San Ramon, Calif.; Richard L. Roberts, Germantown, Tenn., and James A. Greene, Sunnyvale, Calif., assignors to Shaklee Corporation, San Francisco, Calif.

Filed Jul. 10, 1998, Appl. No. 113,815

Int. Cl.[7] **A61K** *7/42;7/44;7/00;31/355;31/34*

U.S. Cl. 424—59 **23 Claims**

1. A topical composition for protecting skin against adverse effects of ultraviolet radiation, comprising:

a mixture of antioxidants that includes lipid soluble and water soluble components, wherein the mixture of antioxidants includes beta-glucan and grape seed extract;

a sunscreen; and

an emulsifier to emulsify a sufficient amount of the mixture of antioxidants and the sunscreen to provide a sun-protective composition comprising an emulsified mixture of the lipid soluble and water soluble components, wherein the emulsified mixture has a sun protection factor (SPF) value that is greater than a sum of the SPF of the antioxidants, sunscreen and emulsifier alone.

6,015,549

METHOD OF PROMOTING ADHESION TO KERATINACEOUS SURFACE, USE OF SAME IN RESHAPING SURFACE, AND KIT THEREFOR

George F. Cowperthwaite, Coatesville; Allen D. Johnston, West Chester, both of Pa., and Susan C. Shearis, Swedesboro, N.J., assignors to Esschem, Inc., Linwood, Pa.

Filed Apr. 17, 1998, Appl. No. 61,948

Int. Cl.[7] **A61K** *6/00;7/00;7/04*

U.S. Cl. 424—61 **16 Claims**

1. A method for improving adhesion of a synthetic monomeric or polymeric material to a keratinaceous substrate comprising alpha-keratin, comprising the step of: applying to said keratinaceous substrate an adhesion-promoting composition comprising (A) an organic, dipolar, aprotic liquid carrier and, uniformly distributed throughout said organic, dipolar, aprotic liquid carrier, (B) pyromellitic dianhydride glycerol dimethacrylate adduct.

6,015,550

METHOD FOR CONTROLLING ODOR USING ALKYLENE CARBONATES

Edward T. Marquis, Austin, Tex., assignor to Huntsman Petrochemical Corporation, Austin, Tex.

Provisional application No. 60/035,980, Jan. 22, 1997. This application Jan. 22, 1998, Appl. No. 10,925.

Int. Cl.[7] **A61L** *9/04*

U.S. Cl. 424—76.1 **16 Claims**

1. A method useful for reducing odor where odoriferous amine-containing compound is present, comprising: applying an alkylene carbonate to a source selected from the group consisting of a

chicken coop, dump, land fill, cat litter, stagnant water, water treatment pond, garbage can, dumpster, dog kennel, zoo, rendering plant, food processing plant, slaughter house, wool plant, fish cannery, underground sewer, paper mill, paper processing mill, outhouse, toilet that has no running water, or public restrooms,

wherein the odoriferous amine-containing compound is present at the source, and

wherein the alkylene carbonate forms a reaction product with the odoriferous amine-containing compounds such that odor is reduced.

6,015,551

COPOLYMERS OF CARBOXYLIC ACIDS AND MULTIPLY OLEFINICALLY UNSATURATED CARBOXYLIC ACID DERIVATIVES AND THEIR USE AS THICKENERS AND DISPERGENTS

Christian Schade, Ludwigshafen; Hans-Ulrich Wekel, Ellerstadt; Axel Sanner, Frankenthal, and Karin Sperling, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP96/05522, § 371 Date Jun. 2, 1998, § 102(e) Date Jun. 2, 1998, PCT Pub. No. WO97/21744, PCT Pub. Date Jun. 19, 1997

PCT Filed Dec. 11, 1996, Appl. No. 77,598

Claims priority, application Germany, Dec. 14, 1995, 195 46 698

Int. Cl.[7] **A61K** *31/74;* **C08L** *67/00;* **C08G** *63/00*

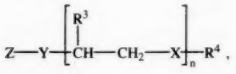
U.S. Cl. 424—78.08 **7 Claims**

1. A copolymer obtained by free-radical polymerization of

A) 70–99.9% by weight of an olefinically unsaturated C_3–C_5-monocarboxylic acid, of an olefinically unsaturated C_4–C_8-dicarboxylic acid or of its anhydride or of a mixture of such carboxylic acids or carboxylic anhydrides with

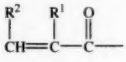
B) 0.1–30% by weight of one or more polyolefinically unsaturated derivatives of the general formula

(I)



where

Z is a vinyl or allyl group or the structure



and

R^1, R^2 are identical or different and are hydrogen or methyl,

R^3 is hydrogen, methyl or ethyl,

R^4 is a mono- or polyolefinically unsaturated C_6–C_{30}-alkenyl or -cycloalkenyl radical with 5 to 8 carbon atoms in the ring or a mono- or diolefinically unsaturated arylalkenyl radical with a total of 9 to 15 carbon atoms,

X is oxygen or NH,

Y is oxygen, NH or N-alkyl,

n is 0 or 1, and

C) 0–29.9% by weight of one or more copolymerizable monomers.

6,015,552

USE OF NERVE GROWTH FACTOR-2 (NGF-2) /NEUROTROPHIN-3 (NT-3) TO PROMOTE LEUKOCYTE PROLIFERATION

Tatsuya Watanabe; Sumie Yoshitomi, both of Osaka, and Reiko Sasada, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of application No. 08/074,969, Jun. 4, 1993, abandoned. This application Aug. 13, 1997, Appl. No. 910,691.

Claims priority, application Japan, Jun. 8, 1992, 4-147749

Int. Cl.[7] **A61K** *38/19;38/18*

U.S. Cl. 424—85.1 **12 Claims**

1. A method of treating neutropenia in a mammal which comprises administering to said mammal a pharmaceutical composition comprising a blood cell increasing amount of nerve growth factor-2.

6,015,553

***BACILLUS SUBTILIS* STRAIN FOR CONTROLLING INSECT AND NEMATODE PESTS**

James John Germida, Saskatoon, Canada; Sherry Darlene Heins; Denise Carol Manker, both of Davis, Calif.; Desmond Rito Jiménez, Woodland, Calif., and Pamela Gail Marrone, Davis, Calif., assignors to AgraQuest, Inc., Davis, Calif.

Filed Aug. 22, 1997, Appl. No. 916,547

Int. Cl.[7] **C12N** *1/20;* **A01N** *63/00*

U.S. Cl. 424—93.462 **9 Claims**

1. An isolated, pure culture of Bacillus strain AQ743, NRRL Accession No. B-21665, having pesticidal activity, and mutants thereof, which mutants maintain the pesticidal activity.

6,015,554

METHOD OF RECONSTITUTING HUMAN LYMPHOID AND DENDRITIC CELLS

Anne H. M. Galy, Palo Alto, Calif., assignor to SyStemix, Inc., Palo Alto, Calif.

Continuation of application No. 08/464,678, filed as application No. PCT/US95/03038, Mar. 9, 1995, abandoned, which is a continuation-in-part of application No. 08/260,185, Jun. 15, 1994, abandoned. This application Jun. 7, 1995, Appl. No. 487,083.

Int. Cl.[7] **A61K** *35/26;35/28;* **C12N** *5/08*

U.S. Cl. 424—93.7 **6 Claims**

1. A method of reconstituting the lymphoid cells of a subject comprising administering to the subject a therapeutically effective amount of an enriched population of human hematopoietic progenitor cells capable of differentiating into lymphoid cells and which do not differentiate into erythroid and myeloid cells, wherein at least 80% of the cells in the population express the markers CD34, CD45RA, CD10, but do not express CD2, CD3, CD4, CD8, CD19, CD20, CD 14, CD15, CD16, CD56 and glycophorin.

6,015,555

TRANSFERRIN RECEPTOR SPECIFIC ANTIBODY-NEUROPHARMACEUTICAL OR DIAGNOSTIC AGENT CONJUGATES

Phillip M. Friden, Bedford, Mass., assignor to Alkermes, Inc., Cambridge, Mass.

Division of application No. 08/232,246, filed as application No. PCT/US92/10206, Nov. 24, 1992, which is a continuation-in-part of application No. 07/800,458, which is a continuation-in-part of application No. PCT/US90/05077, Sep. 7, 1990, abandoned, which is a continuation-in-part of application No. 07/404,089, Sep. 7, 1989, Pat. No. 5,154,924. This application May 19, 1995, Appl. No. 444,644.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *39/395;* C12N *5/20;* C07K *16/28*

U.S. Cl. 424—133.1 6 Claims

1. A method for delivering a neuropharmceutical or diagnostic agent across the blood brain barrier to type brain of a host, wherein the method comprises administering to a host a chimeric antibody, capable of binding to a transferrin receptor present on brain capillary cells, covalenty linked to a neuropharmaceutical or agent, whereby the neuropharmaceutical or agent is transferred across the blood brain barrier when administered in vivo, wherein the chimeric antibody comprises a variable region from one antibody and a constant region from a different antibody.

6,015,556

CYTOTOXIC DRUG THERAPY

Kenneth Dawson Bagshawe, London, United Kingdom, assignor to Enzacta R & D Limited, United Kingdom

Continuation of application No. 08/256,475, filed as application No. PCT/GB93/00039, Jan. 11, 1993, Pat. No. 5,658,568. This application Jun. 30, 1997, Appl. No. 885,281.

Claims priority, application United Kingdom, Jan. 9, 1992, 9200417

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *39/395;38/43;* C07K *16/28;17/00*

U.S. Cl. 424—134.1 2 Claims

1. A therapeutic system comprising a compound comprising a target cell-specific portion and an inactivating-portion capable of converting a substance which, in its native state, is able to inhibit the effect of a cyotoxic agent into a substance which has less effect against said cytotoxic agent, a cytotoxic agent and a substance which in its native state is capable of inhibiting the effect of said cytotoxic agent and which can be converted by said inactivating portion into a substance which has less effect on the cytotoxic agent.

2. A therapeutic system according to claim 1 wherein the cytotoxic agent is either a folic acid antagonist and the substance capable of inhibiting the effect of said agent is folinic acid or an analogue thereof or the cytotoxic agent is a thymidine antagonist and the substance capable of inhibiting the effect of said agent is thymidine or an analogue thereof or it is a combination of both said antagonists.

6,015,557

TUMOR NECROSIS FACTOR ANTAGONISTS FOR THE TREATMENT OF NEUROLOGICAL DISORDERS

Edward L. Tobinick, and Arthur Jerome Tobinick, both of 100 UCLA Medical Plz., Suite 205, Los Angeles, Calif. 90024-6903

Continuation-in-part of application No. 09/256,388, Feb. 24, 1999, abandoned. This application Mar. 23, 1999, Appl. No. 275,070.

Int. Cl.[7] A61K *39/395;31/495;31/50;31/42*

U.S. Cl. 424—134.1 47 Claims

1. A method for inhibiting the action of TNF for treating neurological conditions in a human by administering a TNF antagonist for reducing the inflammation of neuronal tissue of said human, or for modulating the immune response affecting neuronal tissue of said human, comprising the step of:

a) administering a therapeutically effective dosage level to said human of said TNF antagonist selected from the group consisting of etanercept and infliximab for reducing the inflammation of neuronal tissue of said human, or for modulating the immune response affecting neuronal tissue of said human.

6,015,558

TREATMENT OF INSULIN RESISTANCE IN OBESITY LINKED TYPE II DIABETES USING ANTAGONISTS TO TNF-α FUNCTION

Gökhan S. Hotamisligil, Charlestown, and Bruce M. Spiegelman, Waban, both of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Continuation of application No. 08/255,458, Jun. 8, 1994, Pat. No. 5,730,975, which is a continuation of application No. 07/961,792, Oct. 15, 1992, abandoned. This application Mar. 10, 1998, Appl. No. 37,777.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *39/395*

U.S. Cl. 424—142.1 5 Claims

1. A method of treating an animal suffering from insulin resistance, said method comprising

administering to said animal a therapeutic agent that is effective in decreasing insulin resistance, said agent comprising an antagonist to TNF-α function in a pharmaceutically acceptable carrier substance, said agent causing an increase in the peripheral uptake of glucose in response to insulin, wherein said agent comprises an antibody or a portion thereof that interferes with binding of TNF-α to a TNF receptor or that suppresses production of TNF-α protein or of TNF-α m-RNA.

6,015,559

FAS ANTAGONISTS

David H. Lynch, and Mark R. Alderson, both of Bainbridge Island, Wash., assignors to Immunex Corporation, Seattle, Wash.

Division of application No. 08/429,499, Apr. 26, 1995, Pat. No. 5,830,469, which is a continuation-in-part of application No. 08/322,805, Oct. 13, 1994, Pat. No. 5,620,889, which is a continuation-in-part of application No. 08/159,003, Nov. 29, 1993, abandoned, which is a continuation-in-part of application No. 08/136,817, Oct. 14, 1993, abandoned. This application Sep. 14, 1998, Appl. No. 152,733.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *39/395;* C12N *5/06;* C07K *16/00*

U.S. Cl. 424—144.1 17 Claims

1. A composition comprising a purified antibody selected from the group consisting of:

a) a monoclonal antibody that binds to the extracellular domain of human Fas antigen, wherein said antibody inhibits Fas-ligand-mediated apoptosis of human cells expressing Fas antigen; and

b) an antigen-binding fragment of an antibody of (a),

and a physiologically acceptable diluent or carrier.

6,015,560

ANTIBODY RECOGNIZING ENDOTHELIAL CELL LIGAND FOR LEUKOCYTE CR3

Elaine Tuomanen, and H. Robert Masure, both of New York, N.Y., assignors to The Rockfeller University, New York, N.Y.

Division of application No. 08/348,353, Nov. 30, 1994, which is a continuation-in-part of application No. 08/247,572, May 23, 1994, abandoned, which is a continuation of application No. PCT/US92/03725, May 4, 1992, which is a continuation-in-part of application No. 07/695,613, May 3, 1991, abandoned. This application Jun. 6, 1995, Appl. No. 465,966.

Int. Cl.[7] **A61K** *39/40*

U.S. Cl. 424—150.1 **14 Claims**

1. A pharmaceutical composition for administration to a host for the purpose of increasing the permeability of the blood-brain barrier to a molecule, comprising:

a) the molecule to be delivered from the blood to the brain;

b) an antibody to FHA which immunologically binds with brain blood vessel endothelial cells thereby increasing the permeability of the blood-brain barrier to said molecule; and

c) a pharmaceutically acceptable carrier.

6,015,561

ANTIGEN BINDING PEPTIDES (ABTIDES) FROM PEPTIDE LIBRARIES

Vernon L. Alvarez, Morrisville, Pa., assignor to Cytogen Corporation, Princeton, N.J.

Division of application No. 08/488,161, Jun. 7, 1995, Pat. No. 5,885,577, which is a continuation-in-part of application No. 08/310,192, Sep. 21, 1994, abandoned. This application Mar. 22, 1999, Appl. No. 273,685.

Int. Cl.[7] **A61K** *39/395*

U.S. Cl. 424—155.1 **5 Claims**

1. A peptide comprising the amino acid sequence WQOTHFPYT (SEQ ID NO: 6) and the amino acid sequence LVSKNDSG (SEQ ID NO: 7) that specifically binds to an antigen of human prostate carcinoma cells.

6,015,562

TARGETED FORMS OF METHYLTRITHIO ANTITUMOR AGENTS

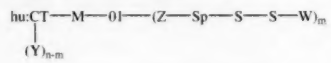
Lois M. Hinman, Sleepy Hollow, and Philip R. Hamann, Garnerville, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Continuation of application No. 08/332,025, Oct. 31, 1994, abandoned, which is a continuation-in-part of application No. 08/132,725, Oct. 6, 1993, abandoned, which is a continuation-in-part of application No. 07/948,277, Sep. 22, 1992, abandoned. This application Feb. 16, 1996, Appl. No. 603,024.

Int. Cl.[7] **A61K** *39/395*

U.S. Cl. 424—181.1 **29 Claims**

1. A cytotoxic drug conjugate of formula:



wherein

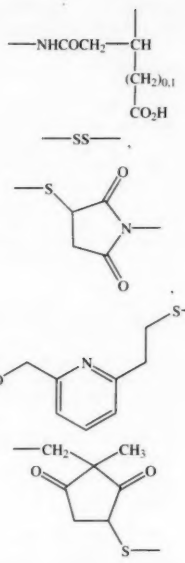
hu:CT-M-01 is a humanized monoclonal antibody reactive to human milk fat globule, its antigen-recognizing fragments, or its chemically manipulated counterparts;

Y is a side-chain amino, carboxyl, or thiol group of a protein, an aldehyde derived from glycoprotein residues, or an amidoalkylthio group;

n is from 1 to 100;

m is 0.1 to 15;

Z is —CONH—, —CONHN=CH—, —CONHNHCH$_2$—, —NHCSNHN=CH—, —NHCH$_2$—, —N=CH—, —CO$_2$—, —NHCH$_2$CO$_2$—,



, or

Sp is a straight or branched-chain divalent or trivalent (C_1–C_{18}) alkyl radical, divalent or trivalent aryl or heteroaryl radical, divalent or trivalent (C_3–C_{18}) cycloalkyl or heterocycloalkyl radical, divalent or trivalent aryl- or heteroaryl-alkyl (C_1–C_{18}) radical, divalent or trivalent cycloalkyl- or heterocycloalkyl-alkyl (C_1–C_{18}) radical or divalent or trivalent (C_2–C_{18}) unsaturated alkyl radical, wherein when Sp is a trivalent radical, Sp can be additionally substituted by amino, alkylamino, arylamino, heteroarylamino, carboxyl, lower alkoxy, hydroxy, thiol, or lower alkylthio groups; and

W is an antitumor antibiotic designated as LL-E33288α_1^{Br}, α_1^I, α_2^{Br}, α_2^I, α_3^{Br}, α_3^I, α_4^{Br}, β_1^{Br}, β_1^I, β_2^{Br}, β_2^I, γ_1^{Br}, γ_1^I, δ_1^I, the iodo or bromo pseudoaglycones, their dihydro or N-acyl counterparts, BBM-1675, FR-900405, FR-900406, PD114759, PD115028, CL-1577A, CL-1577B, CL-1577D, CL-1577E, CL-1724, or their N-acetyl counterparts, from which the CH$_3$—S—S group has been displaced.

6,015,563

POLYPHOSPHAZENE POLYELECTROLYTE IMMUNOADJUVANTS

Alexander K. Andrianov, Belmont; Lendon G. Payne, Arlington; Jonathan R. Sargent, Somerville, and Sameer S. Sule, Woburn, all of Mass., assignors to AVANT Immunotherapeutics, Inc., Needham, Mass.

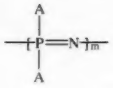
Division of application No. 08/478,552, Jun. 7, 1995. This application Nov. 4, 1998, Appl. No. 185,834.

Int. Cl.[7] **A61K** *39/00;45/00;51/00*

U.S. Cl. 424—184.1 **22 Claims**

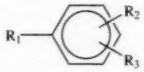
1. A composition for inducing an immunogenic response in an animal, comprising:

an antigen and a polyphosphazene polyelectrolyte adjuvant wherein at least a portion of said polyphosphazene polyelectrolyte has the formula:



wherein each A is independently selected from X or Y in which

(1) X is



in which R_1 is —N(R_4)—, —O— or —OR_5— where R_4 is hydrogen or a C_1–C_4 alkyl(preferably hydrogen) and R_5 is a C_1–C_3 alkylene(preferably methylene) moiety, R_2 is at least one carboxylic acid moiety which can be attached at any ring position directly or through an alkylene, preferably a methylene and R_3 is hydrogen or another substituent moiety such as an alkoxy, for example a methoxy moiety;

(2) Y is selected from the group consisting of

(a) $(OCH_2CH_2)_nOR_6$ in which n is 1 to 120 and R_6 is a C_1 to C_{10} hydrocarbon; and

(b) (B)OR_7 in which B is a polyoxypropylene/polyoxyethylene block copolymer and R_7 is a C_1 to C_{10} hydrocarbon, an aliphatic saturated or unsaturated hydrocarbon or an aromatic hydrocarbon, including alkyl substituted aromatic hydrocarbons;

(3) X and Y are in a range of ratios of 1:40 to 40:1; and

(4) m is 3 to 100,000.

6,015,564

CYTOTOXIC T LYMPHOCYTE-INDUCING LIPOPEPTIDES AND USE AS VACCINES

Christophe Boutillon, Lille; Frederic Martinon, Montrouge; Christian Sergheraert, Morbecque; Remy Magne, L'Etang la Ville; Helene Gras-Masse, Merignies; Elisabeth Gomard, Paris; Andre Tartar, Vitry en Artois, and Jean-Paul Levy, Paris, all of France, assignors to Institut Pasteur de Lille, and Institut National de la Sante et de la Recherche Medicale (INSERM), both of France

Continuation of application No. 08/251,472, May 31, 1994, Pat. No. 5,871,746, which is a continuation-in-part of application No. 07/810,722, Dec. 18, 1991, abandoned. This application Feb. 10, 1999, Appl. No. 248,082.

Claims priority, application France, Dec. 18, 1990, 90 15870

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *39/21;39/00;39/12;* **C07K** *1/00*

U.S. Cl. 424—208.1 **9 Claims**

1. A lipopeptide comprising a peptide having between 10 and 40 amino acids and at least one antigenic determinant, said lipopeptide also comprising at least one chain derived from a member selected from the group consisting of pimelautide, trimexautide, hexadecanoic acid and 2-amino-hexadecanoic acid and/or steroid groups coupled on the α-NH_2 and/or ε-NH_2 functional groups of said amino acids.

6,015,565

GLYCOPROTEIN B OF THE RFHV/KSHV SUBFAMILY OF HERPES VIRUSES

Timothy M. Rose, Seattle; Marnix L. Bosch, Bellevue, and Kurt Strand, Issaquah, all of Wash., assignors to The University of Washington, Seattle, Wash.

Continuation-in-part of application No. PCT/US96/15702, Sep. 26, 1996, and a continuation-in-part of application No. 08/720,229, Sep. 26, 1996, Provisional application No. 60/004,297, Sep. 26, 1995, abandoned. This application Feb. 21, 1997, Appl. No. 804,439.

Int. Cl.[7] **A61K** *39/245;39/12;* **C12N** *15/00;* **C12P** *21/06*

U.S. Cl. 424—229.1 **17 Claims**

1. An isolated polynucleotide comprising a sequence as set forth as nucleotides 36 to 354 of SEQ. ID NO:1 or SEQ. ID NO:3.

6,015,566

PEPTIDE COMPOSITION GENERATING AN IMMUNE RESPONSE AGAINST HERPES VIRUS

Daniel B. Golubev, Jackson Heights, N.Y., and Alexander Chaihorsky, Reno, Nev., assignors to Bio-Virus Research Incorporated, Sparks, Nev.

Continuation-in-part of application No. 08/708,893, Sep. 5, 1996, Pat. No. 5,760,175. This application Jun. 1, 1998, Appl. No. 88,154.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *39/245;39/12;* **C07H** *21/04*

U.S. Cl. 424—229.1 **6 Claims**

1. A pharmaceutical composition for generating an immune response to a herpes virus which comprises an effective amount of a compound comprising Sequence ID 1 coupled through a coupling agent to a pharmaceutically acceptable protein carrier.

6,015,567

HER2 EXTRACELLULAR DOMAIN

Robert Michael Hudziak, San Bruno; H. Michael Shepard, San Francisco, both of Calif., and Axel Ullrich, Martinsried, Germany, assignors to Genentech, Inc., South San Franisco, Calif.

Division of application No. 08/355,460, Dec. 13, 1994, abandoned, which is a continuation of application No. 08/048,346, Apr. 15, 1993, abandoned, which is a continuation of application No. 07/354,319, May 19, 1989, abandoned. This application Apr. 14, 1995, Appl. No. 422,108.

Int. Cl.[7] **A61K** *38/00;* **C07K** *14/705;19/00*

U.S. Cl. 424—277.1 **26 Claims**

1. A method of treating a human patient via active specific immunotherapy comprising administering an effective amount of an extracellular portion of the human HER2 receptor to the patient, wherein the method provokes a cell-mediated immune response to the HER2 receptor in the patient treated therewith.

6,015,568

ANHYDROUS STABLE RETINOL BASED COSMETIC OR PHARMACEUTICAL COMPOSITION

Evelyne Segot, Nogent sur Morne, and Jean-Pierre Laugier, Antony, both of France, assignors to L'Oreal, Paris, France

Continuation of application No. 08/317,879, Oct. 4, 1994, abandoned. This application Apr. 4, 1996, Appl. No. 627,480.

Claims priority, application France, Oct. 5, 1993, 93 11850

Int. Cl.[7] A61K *7/00*

U.S. Cl. 424—401 **7 Claims**

1. An anhydrous retinol based cosmetic lotion consisting of a cosmetically or pharmaceutically effective amount of retinol solubilized in an organic solvent liquid at ambient temperature, said organic solvent being selected from the group consisting of:

(i) a branched aliphatic alcohol having C_{16}–C_{20},

(ii) a straight or branched saturated alkyoxylated fatty alcohol having C_{16}–C_{20}, and

a mixture thereof.

6,015,569

POLYCYCLIC AROMATIC COMPOUNDS AND PHARMACEUTICAL/COSMETIC COMPOSITIONS COMPRISED THEREOF

Jean-Michel Bernardon, Le Rouret, France, assignor to Centre International de Recherches Dermatologiques Galderma, Valbonne, France

Continuation of application No. 08/429,096, Apr. 26, 1995, Pat. No. 5,766,610. This application Nov. 17, 1997, Appl. No. 971,983.

Claims priority, application France, Apr. 26, 1994, 94 05019

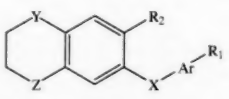
This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *31/395;31/44;* **C07D** *213/70*

U.S. Cl. 424—401 **33 Claims**

1. A polycyclic aromatic compound having the structural formula (I):

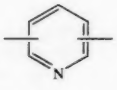
(I)



in which R_1 is a $—CH_3$ radical, a $—CH_2—O—R_3$ radical, a $—CH_2—O—CO—R_4$ radical, an $—O—R_5$ radical, an $—O—(—CH_2—)_m—(—CO—)_n—R_6$ radical, a $—CO—R_7$ radical, a $—CO—O—R_8$ radical or an $—S(O)_p—R_9$ radical, wherein m, n, p and the radicals R_3 to R_9 are as defined below; R_2 is a hydrogen atom or a halogen atom, a lower alkyl radical, an $—NO_2$ radical, an $—O—COR_4$ radical, an $—OR_9$ radical or a radical:

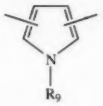
wherein the radicals R_4, R_9 and R_{10} are as defined below; Ar is a radical selected from among those of the following formulae (b) and (e):

(b)



-continued

(e)



X is —O—, $—S(O)_t—$ or an $—NR_9—$ radical wherein t is as defined below; Y and Z are each —O—, $—S(O)_t—$ or a radical $—CR_{11}R_{12}$, wherein the radicals R_{11} and R_{12} are as defined below; m is an integer equal to 1, 2 or 3; n is an integer equal to 0 or 1; p is an integer equal to 0, 1, 2 or 3; t is an integer equal to 0, 1 or 2; R_3 is a hydrogen atom or a lower alkyl radical; R_4 is a lower alkyl radical; R_5 is a hydrogen atom or a lower alkyl radical; R_6 is a lower alkyl radical or a heterocycle; R_7 is a hydrogen atom, a lower alkyl radical or a radical:

in which R' and R", which may be identical or different, are each a hydrogen atom, a lower alkyl radical, a mono- or polyhydroxyallyl radical, an optionally substituted aryl radical, or an amino acid or peptide or sugar residue, with the proviso that R' and R" may together form, with the nitrogen atom from which they depend, a nitrogen-containing heterocycle; R_8 is a hydrogen atom, a linear or branched alkyl radical having from 1 to 20 carbon atoms, an alkenyl radical, a mono- or polyhydroxyalkyl radical, an optionally substituted aryl or aralkyl radical or a sugar residue or an amino acid or peptide residue; R_9 is a hydrogen atom or a lower alkyl radical; R_{10} is a hydrogen atom or a lower alkyl radical; R_{11} is a hydrogen atom or a lower alkyl radical; R_{12} is a hydrogen atom or a lower alkyl radical; with the proviso that Y and Z cannot at the same time each be an oxygen atom or an $—S(O)_t—$ radical; and with the further proviso that (i) if R_1 is $—O—R_5$, then R_5 is not a lower alkyl radical; (ii) if R_1 is $—O—(CH_2)_m(CO)_n—R_6$, then m is not 2 or 3; (iii) if R_1 is $—CO—R_7$, then R_7 is not a lower alkyl radical; and (iv) if R_1 is $—S(O)_p—R_9$, then R_9 is not a lower alkyl radical; or a pharmaceutically/cosmetically acceptable salt or optical or geometric isomer thereof.

6,015,570

SLOW-RELEASE INSECT-REPELLENT COMPOSITIONS AND USES

Raymond J. Tucci, Yardley, Pa., and Nathan M. Dry, Greensboro, N.C., assignors to Tucci Associates, Inc., Yardley, Pa.

Continuation-in-part of application No. 08/663,267, Dec. 12, 1994, abandoned, which is a continuation-in-part of application No. 08/173,416, Dec. 23, 1993, abandoned. This application Aug. 20, 1998, Appl. No. 137,426.

Int. Cl.[7] A01N *25/34*

U.S. Cl. 424—403 **17 Claims**

1. An article of manufacture comprising (i) a fabric substrate and (ii) an insect-repellant composition, wherein said insect-repellant composition is prepared as an aqueous consisting essentially of an amine insect-repellant, at least two reactive silicones soluble with said amine insect-repellant, and starch; said insect-repellant composition being dried into a powder and applied to said fabric at from about 2% to about 30% on weight of fabric (owf), to form said article of manufacture having insect repellancy.

6,015,571

MICROCAPSULES CONTAINING SUSPENSIONS OF BIOLOGICALLY ACTIVE COMPOUNDS

Herbert B. Scher, Moraga, and Jin Ling Chen, El Cerrito, both of Calif., assignors to Zeneca Limited, United Kingdom

Continuation of application No. 08/153,111, Nov. 15, 1993, abandoned. This application Dec. 12, 1994, Appl. No. 354,409.

Int. Cl.[7] A01N *25/28*

U.S. Cl. 424—408 27 Claims

1. A microcapsule containing a solid agrochemical material suspended in a water-immiscible organic liquid and from about 0.01 to about 10 percent by weight, based on the weight of the capsule and its contents, of a dispersant which functions to keep the solid in the liquid but does not allow the solid to be extracted into water, is active only at the solid/organic liquid interface and does not act as an emulsifying agent, said microcapsule having an average particle size of about 1–200 microns, wherein said solid has an average particle size of about 0.01–50 microns, and wherein said solid is an herbicide.

6,015,572

IMPLANTABLE DEVICE CONTAINING GDNF SECRETING CELLS FOR TREATING NERVE DAMAGE AND METHODS OF USE

Leu-Fen H. Lin, Boulder, Colo.; Franklin D. Collins, Agoura Hills, Calif.; Daniel H. Doherty, Boulder, Colo.; Jack Lile, Nederland, Colo., and Susan Bektesh, Boulder, Colo., assignors to Amgen Inc., Thousand Oaks, Calif.

Division of application No. 08/182,183, filed as application No. PCT/US92/07888, Sep. 17, 1992, which is a continuation-in-part of application No. 07/855,413, Mar. 19, 1992, abandoned, which is a continuation-in-part of application No. 07/788,423, Nov. 6, 1991, abandoned, which is a continuation-in-part of application No. 07/774,109, Oct. 8, 1991, abandoned, which is a continuation-in-part of application No. 07/764,685, Sep. 20, 1991, abandoned. This application May 30, 1995, Appl. No. 453,176.

Int. Cl.[7] A61F *2/00;* A61K *9/22;* C12N *11/04*

U.S. Cl. 424—424 9 Claims

1. A device for treating nerve damage by implantation in a patient comprising:

a membrane, and

one or more cells modified to express and secrete glial cell line-derived neurotrophic factor encapsulated within said membrane, provided however, said one or more cells are not B49 glioblastoma cells,

wherein said membrane is permeable to said glial cell line-derived neurotrophic factor, and impermeable to immune system materials from said patient which are detrimental to said cells, and

wherein said glial cell line-derived neurotrophic factor is a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:4 or SEQ ID NO:6 or a polypeptide which is at least 70% identical to an amino acid sequence set forth in SEQ ID NO:4 or SEQ ID NO:6 when four gaps in a length of 100 amino acids may be introduced to assist in that alignment, and wherein said glial cell line-derived neurotrophic factor has the ability to promote the survival or function of nerve cells.

6,015,573

NUCLEOSIDE PHOSPHATE THERAPY FOR VIRAL INFECTION

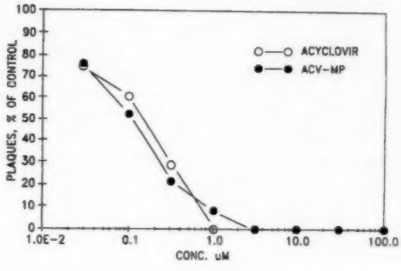
Karl Y. Hostetler, 14024 Rue St. Raphael, Del Mar, Calif. 92014

Continuation of application No. 08/758,501, Dec. 2, 1996, Pat. No. 5,756,116, which is a continuation of application No. 08/060,258, May 12, 1993. This application Dec. 16, 1997, Appl. No. 991,740.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *9/70;31/74;31/52;* A01N *43/90*

U.S. Cl. 424—443 21 Claims



1. A method for treatment of a mammal infected with an anti-herpes nucleoside-resistant strain of herpes virus comprising administering to said mammal an effective amount of an antiviral nucleoside phosphate ester wherein said antiviral nucleoside is selected from the group consisting of

(1-beta-D-arabinofuranosyl-E-5-(2-bromovinyl)uracil;

2'-fluorocarbocyclic-2'-deoxyguanosine;

6'-fluorocarbocyclic-2'-deoxyguanosine;

1-(beta-D-arabinofuranosyl)-5(E)-(2-iodovinyl)uracil;

(1r-1α, 2β,3α)-2-amino-9-(2,3-bis(hydroxymethyl)cyclobutyl)-6H-purin-6-one;

9H-purin-2-amine, 9-((2-(1-methylethoxy)-1-((1-methylethoxy)methyl)ethoxy)methyl)-9CI);

trifluorothymidine;

9-((1,3-dihydroxy-2-propoxy)methyl)guanine;

5-ethyl-2'-deoxyuridine;

E-5-(2-bromovinyl-2'-deoxyuridine;

5-(2-chloroethyl)-2'-deoxyuridine;

buciclovir;

6-deoxyacyclovir;

9-(4-hydroxy-3-hydroxymethylbut-1-yl)guanine;

E-5-(2-iodovinyl)-2'-deoxyuridine;

5-vinyl-1-beta-D-arabinofuranosyluracil;

1-beta-D-arabinofuranosylthymine;

2'-nor-2'-deoxyguanosine;

9-(4-hydroxy-3-hydroxymethylbut-1-yl)guanine;

1-beta-D-arabinofuranosyladenine; and pharmaceutically acceptable salts thereof.

6,015,574

LIPOPHILIC CARRIER SYSTEMS

David W. Cannell, New York, N.Y.; Hitren Mathur, Woodbridge, N.J.; Nghi Nguyen, Edison, N.J., and Cynthia Espino, Princeton, N.J., assignors to L'Oreal, Paris, France

Filed Jun. 9, 1997, Appl. No. 871,524

Int. Cl.[7] A61R *9/10*

U.S. Cl. 424—450 22 Claims

1. A composition comprising:

at least one organic phospholipid capable of forming bilayers in aqueous solution;

at least one amphoteric surfactant; and

at least one nonionic surfactant present in an amount by weight equal to or greater than the amount of said at least one phospholipid,

wherein said at least one phospholipid, said at least one amphoteric surfactant, and said at least one nonionic surfactant are present in a combined amount sufficient to allow lipophilic ingredients to be incorporated into an aqueous solution containing said composition.

16. A delivery system for lipophilic materials comprising:

an organic phospholipid capable of forming bilayers in aqueous solution;

an amphoteric surfactant;

a nonionic surfactant present in an amount by weight equal to or greater than the amount of said organic phospholipid;

a lipophilic ingredient other than said phospholipid; and

an aqueous phase, wherein said organic phospholipid, said nonionic surfactant, and said amphoteric surfactant are present in a combined amount sufficient to allow said lipophilic ingredient to be incorporated into said system, and

wherein said system exhibits substantially no phase separation.

6,015,575

LIPOSOMOGENIC UV ABSORBERS

Helmut Luther, Grenzach-Wyhlen; Dietmar Hüglin, Freiburg, and Bernd Herzog, Grenzach-Wyhlen, all of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

PCT No. PCT/EP96/00959, § 371 Date Sep. 15, 1997, § 102(e) Date Sep. 15, 1997, PCT Pub. No. WO96/29302, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 7, 1996, Appl. No. 913,531

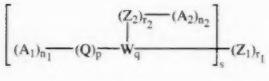
Claims priority, application Switzerland, Mar. 17, 1995, 772/95

Int. Cl.[7] **C07C** *219/10;69/734;229/12;* **C07D** *251/54*

U.S. Cl. 424—450 **15 Claims**

1. A liposomogenic UV absorber comprising a hydrophilic head group (=Z),a spacer (=W), a UV chromophore (Q) having an absorption in the range from 285 to 400 nm and at least one hydrophobic tail group (=A), which is of the formula

(1)



in which

A_1 and A_2, independently of one another, are a hydrophobic alkyl, alkoxy, acyl or alkylamino radical, the chains having at least 8 carbon atoms,

Q is a UV chromophore selected from the group consisting of

(Q_2) triazine derivatives,

(Q_3) benzotriazoles,

(Q_4) benzophenones, and

(Q_5) p-aminobenzoic acid derivatives,

W is a divalent alkylene radical,

Z_1 and Z_2, independently of one another, are a hydrophilic radical selected from the class of (Z_a) ammonium or amine compounds, (Z_b) phosphate compounds, (Z_3) carboxylate compounds, (Z_d) polyols, and (Z_e) sulphate compounds,

n_1 and n_2, independently of one another, are a number from 0 to 4, $n_1=n_2=0$ not being additionally included,

p is 1 or 2,

q is a number from 0 to 3,

r_1 is 1 or 2,

r_2 is 0 or 1, and

s is a number from 1 to 3.

6,015,576

METHOD FOR INDUCING A SYSTEMIC IMMUNE RESPONSE TO AN ANTIGEN

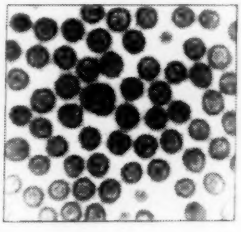
Jackie R. See, Reno, Nev., and Darryl M. See, Laguna Niguel, Calif., assignors to Bio-Sphere Technology, Inc., Reno, Nev.

Continuation of application No. PCT/US97/04634, Mar. 24, 1997, which is a continuation-in-part of application No. 08/621,802, Mar. 22, 1996, abandoned. This application Aug. 29, 1997, Appl. No. 920,374.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *9/127;9/133*

U.S. Cl. 424—450 **52 Claims**



1. A method for stimulating a systemic immune response to an antigen in a mammal comprising:

providing a liposomal preparation comprising lyophilized liposomes containing at least one antigen, wherein the liposomes have at least three different sizes, before lyophilization and consisting essentially of:

at least 5% by volume, based on the total value of liposomes in the preparation, small liposomes having a size, before lyophilization, of from about 20 nm to about 1 micron,

at least 5% by volume, based on the total volume of liposomes in the preparation, medium liposomes having a size, before lyophilization, of from about 1 micron to about 3 microns, and

at least 5% by volume, based on the total volume of liposomes in the preparation, large liposomes having a size, before lyophilization, of from about 3 microns to about 20 microns; and

orally administering an effective amount of the liposomal preparation to a mammal, whereby sufficient antigen containing liposomes are absorbed in the Peyer's patches of the gut of the mammal and are taken up by macrophages in the Peyer's patches to stimulate a systemic immune response.

6,015,577

PHARMACEUTICAL COMPOSITIONS CONTAINING DIPYRIDAMOLE OR MOPIDAMOL AND ACETYLSALICYLIC ACID OR THE PHYSIOLOGICALLY ACCEPTABLE SALTS THEREOF, PROCESSES FOR PREPARING THEM AND THEIR USE IN TREATING CLOT FORMATION

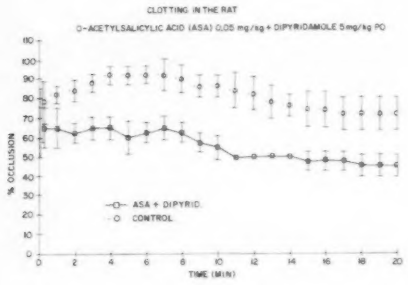
Wolfgang Eisert, and Peter Gruber, both of Biberach, Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

Continuation of application No. 08/261,789, Jun. 20, 1994, abandoned, which is a continuation of application No. 08/003,909, Jan. 13, 1993, abandoned, which is a continuation of application No. 07/879,258, May 6, 1992, abandoned, which is a continuation of application No. 07/750,345, Aug. 27, 1991, abandoned, which is a continuation of application No. 07/584,393, Sep. 18, 1990, abandoned, which is a continuation of application No. 07/423,108, Oct. 18, 1989, abandoned, which is a continuation of application No. 07/240,981, Sep. 6, 1988, abandoned, which is a continuation of application No. 07/084,648, Aug. 12, 1987, abandoned. This application Apr. 12, 1995, Appl. No. 421,351.

Claims priority, application Germany, Aug. 13, 1986, 36 27 423

Int. Cl.[7] A61K *9/36;9/58;9/62;31/62*

U.S. Cl. 424—451 20 Claims



1. A pharmaceutical composition for oral administration comprising:

a first component selected from the group consisting of dipyridamole, and the pharmaceutically acceptable salts thereof; and

a second component selected from the group consisting of acetylsalicylic acid and the pharmaceutically acceptable salts thereof;

said first and second components being present in a weight ratio in the range between 8:1 and 100:1;

a pharmaceutically acceptable acid excipient formulated together with said first component in the form of granules provided with a coating made up of 50 to 100% of lacqueurs which are insoluble in acid but soluble in intestinal juices and 50 to 0% of lacqueurs which are insoluble in both gastric and intestinal juices, and said acid excipient being in a ratio of at least one equivalent of said acid excipient to 1 mol of said first component;

said second component being present in the form of a tablet; and all components being contained together within a capsule.

6,015,578

TRAPIDIL FOR USE IN THE THERAPY OF SYNDROME THAT MAY BE INFLUENCED BY IMMUNOMODULATORS

Hatto Walch, Laupheim, Germany, assignor to Rodleben Pharma GmbH, Rodleben, Germany

PCT No. PCT/EP96/01037, § 371 Date Oct. 9, 1997, § 102(e) Date Oct. 9, 1997, PCT Pub. No. WO96/32111, PCT Pub. Date Oct. 17, 1996

PCT Filed Mar. 11, 1996, Appl. No. 945,216

Claims priority, application Germany, Apr. 13, 1995, 195 14 048

Int. Cl.[7] A61K *9/20*

U.S. Cl. 424—464 19 Claims

1. A method for the therapy of diseases which respond to substances with immunomodulatory activity comprising administration to a patient a drug comprising Trapidil as an immunomodulating active ingredient.

6,015,579

PROCESS FOR ENHANCING THE INCORPORATION OF WHEY PROTEINS IN THE CHEESE CURD

Juan A. Sanchelima, 1783 N.W. 93rd Ave., Miami, Fla. 33172

Continuation-in-part of application No. 08/961,678, Oct. 31, 1997, Pat. No. 5,901,740. This application Aug. 21, 1998, Appl. No. 138,344.

Int. Cl.[7] A23C *9/12*

U.S. Cl. 426—36 4 Claims

1. A process for making cheese curd, comprising:

A) raising the temperature of the milk to a temperature between 75 degrees centigrade and 85 degrees centigrade for a period of time not less than 10 minutes and not more than 30 minutes;

B) lower the temperature of the milk to between 38 degrees centigrade and 48 degrees centigrade;

C) coagulating the milk by adding a coagulation agent at a rate between 50 and 60 ml. per 1000 liters of milk;

D) cutting the curd in small pieces so that the effective surface area is increased to maximize the adhesion of whey protein to the curd;

E) adding calcium chloride to the milk between 400 and 440 grams per 1000 liters and the calcium chloride being granulated food grade type at 94.5% purity;

F) draining the resulting curd; and

G) molding the resulting curd pieces maintaining the temperature between 38 degrees centigrade and 48 degrees centigrade.

6,015,580

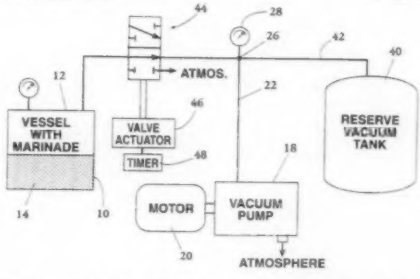
METHOD OF TENDERIZING MEAT

Ralph C. Mays, 5436 S. Mingo Rd., Tulsa, Okla. 74146

Filed Jul. 11, 1996, Appl. No. 678,242

Int. Cl.[7] A23L *1/318;* A22C *9/00*

U.S. Cl. 426—281 27 Claims



10. A method of tenderizing meat comprising the steps of submerging the meat in a liquid and while submerged subjecting

the meat to a preselected vacuum and cycling the vacuum through a preselected rate within a range of about 5 inches of mercury for a preselected time sufficient to physically degrade the meat to obtain desired tenderness.

6,015,581

METHOD AND APPARATUS FOR PREPARING A BREAD SNACK

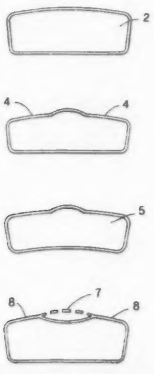
Bruno Reimers; Joseph Mensing, both of Reken, and Wilhelm Holtkamp, Bottrop, all of Germany, assignors to Unilever, N.V., Netherlands

Filed Feb. 5, 1998, Appl. No. 18,865

Claims priority, application European Pat. Off., Feb. 5, 1997, 97200321

Int. Cl.[7] **A23G** *3/00;* **A21C** *15/00*

U.S. Cl. 426—282 **20 Claims**



1. A process for the removal of part of the top of a bread product having a substantially flat top including a central part and outer parts, comprising the steps of:

(a) applying forces on the bread product which are greater on the outer parts of the bread product than on the central part of the bread product, which forces cause the top of the bread product to bend and form a protruding portion in the central part of the bread product, which portion protrudes above the outer parts of the bread product;

(b) cutting at least a part of the protruding portion of the central part of the bread product;

(c) removing the cut part; and

(d) removing the forces from the outer parts of the top of the bread product; whereby completing steps (a) through (d) results in the formation of a cavity having upstanding rims in the central part of the bread product.

6,015,582

WATER ABSORBING ARTICLE AND METHOD OF USING THE SAME

Yohei Kageyama; Takeshi Banba, and Eikichi Kogure, all of Kawasaki, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed May 20, 1998, Appl. No. 81,614

Claims priority, application Japan, May 20, 1997, 9-129832; May 20, 1997, 9-129833; May 20, 1997, 9-129834

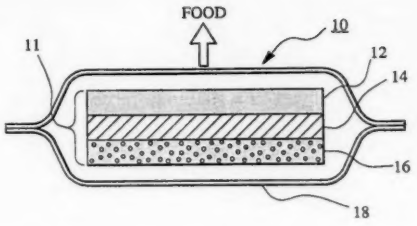
Int. Cl.[7] **B65D** *81/26*

U.S. Cl. 426—392 **9 Claims**

1. A water absorbing article for absorbing drip exuded from food, comprising:

a water absorbing sheet comprising at least three layers comprising a liquid permeable layer formed by paper or pulp, a water absorbing layer formed by paper or pulp containing scattered particles of a water absorbing agent, and a liquid impermeable layer placed between said liquid permeable layer and said water absorbing layer;

wherein said water absorbing sheet is placed in a bag formed by a liquid permeable sheet.



3. A method of using a water absorbing article for absorbing drip exuded from food said method comprising the steps of:

placing a food on a liquid permeable layer side of the water absorbing article of claim **1**; and

vacuum packing the food and the water absorbing article, with an air impermeable sheet.

6,015,583

DUAL WEB PACKAGE HAVING LABELING MEANS

Arthur T. Krebs, and H. Walker Stockley, both of Spartanburg, S.C., assignors to Cryovac, Inc., Duncan, S.C.

Filed Jun. 28, 1996, Appl. No. 670,859

Int. Cl.[7] **A23B** *55/00*

U.S. Cl. 426—396 **20 Claims**

15. A method for providing a packaged product comprising the steps of:

a) packaging the product by a method comprising the steps of:

i) providing an impermeable support member for supporting and containing the product, the support member having sidewalls and a base defining an inner surface and an outer surface;

ii) positioning the product within the inner surface of the support member;

iii) sealing a first, permeable film to the support member for enclosing the product within the inner surface of the support member; and

iv) enclosing the first film with a second, impermeable film;

b) providing labeling means comprising a label capable of adhering to the first permeable film and comprising printed information individualized to the product;

c) adhering the labeling means to the outer surface of the support member such that the label is removable therefrom;

d) distributing the package to a retail facility;

e) removing the second, impermeable film such that gases are exchanged into and out of the package via the first, permeable film;

f) removing the label from the outer surface of the support member; and

g) adhering the label to the first, permeable film.

6,015,584

DOUGH BALL LOADER AND METHOD OF FLATTENING A DOUGH BALL

Eric Clay Lawrence, South El Monte, Calif., assignor to Lawrence Equipment, South El Monte, Calif.

Filed Mar. 19, 1998, Appl. No. 44,520

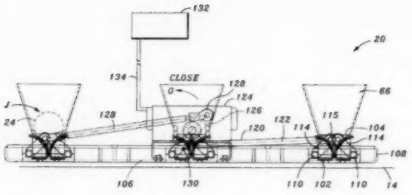
Int. Cl.[7] **A21C** *9/08;11/00*

U.S. Cl. 426—502 **12 Claims**

10. A method for flattening a doughball, comprising the steps of:

pivoting a pair of opposing flatteners into a closed position;

dropping the dough ball down a tube, onto curved upper surfaces of the opposing pair of flatteners, with the flatteners in the closed position;



pivoting the flatteners in mutually opposite directions into an open position, with the doughball supported on the curved upper surfaces, and thereby creating an opening between the flatteners;

allowing the doughball to fall through the opening and onto a conveyor;

pivoting the flatteners to return them to the closed position;

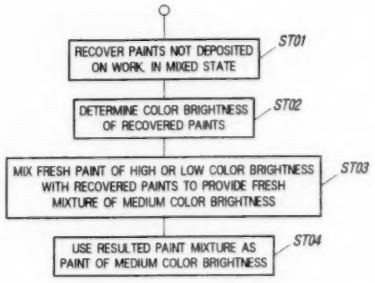
flattening the doughball by having the flatteners press the doughball down onto the conveyor.

6,015,585

POWDER COATING PROCESS USING TWO OR MORE KINDS OF POWDER PAINT

Masayuki Yamaguchi; Yukihide Yamashita, and Kenichiro Mori, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1998, Appl. No. 123,649
Claims priority, application Japan, Aug. 22, 1997, 9-226462
Int. Cl.[7] B05D *1/02*
U.S. Cl. 427—8 **1 Claim**


RECOVER PAINTS NOT DEPOSITED ON WORK IN MIXED STATE
ST01
DETERMINE COLOR BRIGHTNESS OF RECOVERED PAINTS
ST02
MIX FRESH PAINT OF HIGH OR LOW COLOR BRIGHTNESS WITH RECOVERED PAINTS TO PROVIDE FRESH MIXTURE OF MEDIUM COLOR BRIGHTNESS
ST03
USE RESULTED PAINT MIXTURE AS PAINT OF MEDIUM COLOR BRIGHTNESS
ST04

1. A powder coating process using at least two kinds of powder paints having different levels of color brightness selectively for coating different pieces of work, said process comprising the steps of:

spraying a first powder paint of said at least two kinds of powder paints against at least a first of said different pieces of work;

after spraying said first powder paint, spraying a second powder paint of said at least two kinds of powder paints against at least a second of said different pieces of work;

recovering a mixture of said first and second powder paints which have failed to be deposited on any of said different pieces of work;

determining the color brightness of said mixture;

adding a fresh supply of said first or second powder paint to said mixture to prepare a fresh mixture having a desired level of color brightness which is intermediate between said different levels of color brightness of said first and second powder paints; and

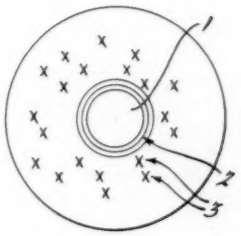
using said fresh mixture as a powder paint of immediate color brightness level.

6,015,586

COLD DRY PLATING PROCESS FOR FORMING A POLYCRYSTALLINE STRUCTURE FILM OF ZINC-IRON BY MECHANICAL PROJECTION OF A COMPOSITE MATERIAL

Shigeru Omori, Okayama, Japan, and Jean Marie Kieffer, Obernai, France, assignors to Acheson Industries, Inc., Port Huron, Mich.

Filed Feb. 19, 1998, Appl. No. 26,330
Int. Cl.[7] B05D *3/14*
U.S. Cl. 427—11 **9 Claims**



1. A cold dry plating process comprising the step of: projecting a composite material consisting essentially of mono nucleus particles and poly nuclei particles on to a metallic substrate to form a polycrystalline film of zinc-iron alloy on the metallic substrate, and

wherein the equipment used for cold dry plating is designed for a continuous projection of composite material with a recycling of the composite material after separation of the iron alloy particles,

wherein mono nucleus and poly nuclei particles are encapsulated in a zinc-iron alloy whose composition is defined as Fe Zn_{13} and Fe Zn_7, and

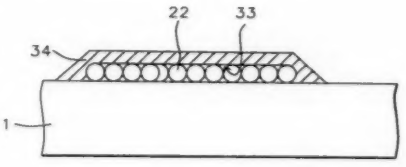
wherein the composite material has zinc content between 45% and 80% by weight.

6,015,587

LOW TEMPERATURE METHOD FOR PHOSPHOR SCREEN FORMATION

Yui-Shin Fran, Hsin-chu; De-An Chang, and Chih-Hao Tien, both of Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsin-Chu, Taiwan

Filed Mar. 16, 1998, Appl. No. 39,500
Int. Cl.[7] B05D *5/06*
U.S. Cl. 427—64 **12 Claims**



1. A process for manufacturing a phosphorescent screen, comprising:

providing a phosphor in powder form, a liquid solvent, a binder, and a substrate;

combining the phosphor, the binder, and the solvent to form a slurry;

applying the slurry to a surface of the substrate thereby forming a layer of phosphor powder and organic material;

heating said layer whereby said organic material dries, thereby providing the phosphor and organic layer with a smooth upper surface;

depositing a layer of aluminum directly on and fully covering said phosphor and organic layer, thereby providing the aluminum layer with a smooth lower surface; and

firing the layers at a temperature that is less than 500° C., thereby removing all organic material from the phosphor and organic layer without roughening said smooth lower surface.

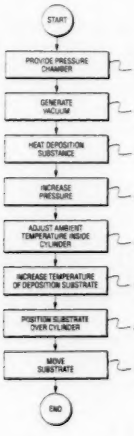
6,015,588
METHOD FOR FABRICATING ELECTRON MULTIPLIERS

Samuel Goukassian, Livonia, Mich., assignor to Electron R+D International, Inc., Farmington, Mich.

Division of application No. 08/440,754, May 15, 1995, Pat. No. 5,624,706, which is a continuation-in-part of application No. 08/321,042, Oct. 5, 1994, abandoned, which is a continuation of application No. 08/092,083, Jul. 15, 1993. This application Sep. 13, 1996, Appl. No. 713,774.

Int. Cl.[7] **B05D** *5/12*

U.S. Cl. 427—77 **15 Claims**



1. A micro random channel plate device suitable for use in an electron multiplier, comprising:

a substrate having on at least one surface thereof a performing substance layer of 10 μm to 3000 μm thickness comprising a plurality of randomly situated randomly orientated crystallite dynodes having interspersed therebetween a plurality of random microchannels, said microchannels composed of open space, the average electron track length $\bar{L}$ of said microchannels being greater than 2 μm and less than said thickness of said performing substance layer, said microchannel plate device having a gain in excess of 10^4, and a dark current less than 0.2 sec^{-1} cm^{-2}, wherein said performing substance layer has a density of from 0.3% to about 4% of the density of the performing substance when in a monocrystalline state.

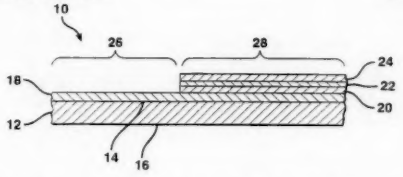
6,015,589
METHOD OF DESENSITIZING A THERMALLY IMAGABLE SURFACE

Rajendra Mehta, Dayton; Gary Doll, Englewood; Mark Dotson, Dayton; A. Dale Lakes, Dayton, and Rick L. Shields, Dayton, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Division of application No. 08/794,476, Feb. 4, 1997, Pat. No. 5,810,397, which is a continuation-in-part of application No. 08/235,543, Apr. 29, 1994, abandoned, which is a continuation-in-part of application No. 08/055,576, May 3, 1993, abandoned. This application Apr. 16, 1998, Appl. No. 61,454.

Int. Cl.[7] **B41M** *5/34*

U.S. Cl. 427—152 **7 Claims**



1. A process for producing a thermally imagable business record which may be imaged to form multicolored images comprising the steps of:

a) providing a substrate having first and second major surfaces, said substrate containing a first thermally imagable coating on said first surface, which when activated, forms a first color;

b) desensitizing at least one selected area of said first surface of said substrate by applying a desensitizing composition in said selected area to form a desensitized area; and

c) applying at least one additional thermally imagable coating over said desensitized area of said substrate, said at least one additional thermally imagable coating being activatable to form a second color which is different from said first color, wherein both of said first thermally imagable coating and said at least one additional thermally imagable coating are adapted to be activated in a single pass through a thermal printer.

6,015,590
METHOD FOR GROWING THIN FILMS

Tuomo Suntola, and Sven Lindfors, both of Espoo, Finland, assignors to Neste Oy, Finland

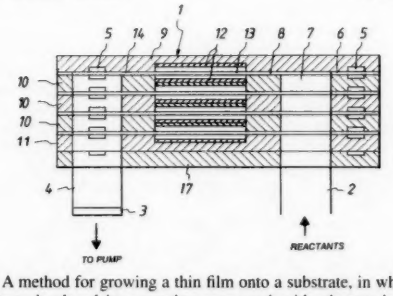
PCT No. PCT/FI95/00658, § 371 Date Sep. 25, 1996, § 102(e) Date Sep. 25, 1996, PCT Pub. No. WO96/17107, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 28, 1995, Appl. No. 682,705

Claims priority, application Finland, Nov. 28, 1994, 945611

Int. Cl.[7] **C23C** *16/00;* **C30B** *25/14*

U.S. Cl. 427—255.23 **10 Claims**



1. A method for growing a thin film onto a substrate, in which a substrate is placed in a reaction space and said substrate is subjected to alternately repeated surface reactions of a plurality of vapor phase reactants to form a thin film, said method comprising the steps of:

feeding said vapor phase reactants into said reaction space in the form of vapor phase pulses repeatedly and alternately, each reactant separately from its own source;

causing said vapor phase reactants to react with the surface of the substrate to form a thin film compound on said substrate;

evacuating said reaction space between two successive vapor phase pulses by connecting the reaction space to a pump so that substantially all of said reactants remaining in said reaction space and adsorbed on inner walls of said reaction space are removed to a level of less than 1% prior to the inflow of a second pulse of said two successive vapor phase pulses; and

feeding an inactive gas into said reaction space simultaneously with said evacuating step.

6,015,591

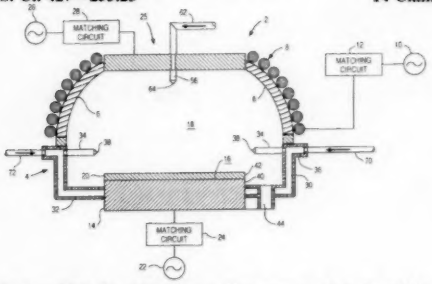
DEPOSITION METHOD

Shijian Li, San Jose; Fred C. Redeker, Fremont, and Tetsuya Ishikawa, Santa Clara, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of application No. 08/571,618, Dec. 13, 1995, Pat. No. 5,772,771. This application Feb. 13, 1998, Appl. No. 23,500.

Int. Cl.[7] C23C *16/44*

U.S. Cl. 427—255.23 **14 Claims**



1. A method for depositing a film onto a substrate within a deposition chamber comprising the steps of:

injecting a first process gas into the chamber at a plurality of positions located generally above a periphery of a substrate within the chamber;

the first process gas injecting step including injecting the first process gas through a plurality of first orifices generally parallel to the substrate in a radially inwardly-directed pattern;

injecting a second process gas into the chamber at a region spaced apart from and located centrally of the substrate; and

the second process gas injecting step including injecting the second process gas through at least one second orifice generally directly at a central region of the substrate;

whereby injecting the second process gas helps to control deposition uniformity.

6,015,592

LIGHT-SCREENING FILM PAINT FOR LAMPS, AND LIGHT-SCREENING FILM FOR LAMPS AND PRODUCING METHOD THEREOF

Tatsuo Mifune; Kazunori Sakamoto, both of Katano; Tsumoru Ohata, Kyoto, and Masaru Watanabe, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

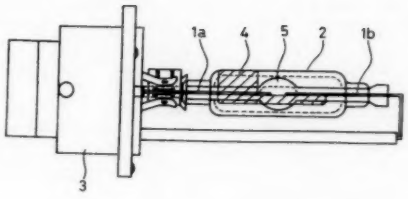
Continuation-in-part of application No. 08/818,901, Mar. 17, 1997, abandoned. This application Sep. 10, 1998, Appl. No. 150,340.

Claims priority, application Japan, Mar. 19, 1996, 8-062366; Nov. 18, 1996, 8-305405

Int. Cl.[7] B05D *3/02;3/00*

U.S. Cl. 427—376.2 **12 Claims**

1. A method for producing a light-screening film for lamps, comprising the steps of:



preparing a light-screening paint comprising (1) an iron oxide compound doped with a metallic manganese and having the formula $(Fe_xMn_{1-x})_2O_3$ where 0.95>x>0.70, and (2) powder glass containing at least one of silica, zinc oxide, boron oxide and aluminum oxide;

applying the thus-prepared paint to the surface of a lamp; and

forming a light-screening film by firing at a temperature no higher than 1,200° C.

6,015,593

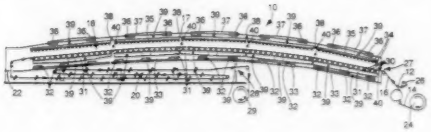
METHOD FOR DRYING A COATING ON A SUBSTRATE AND REDUCING MOTTLE

Roger K. Yonkoski, Woodbury, Minn.; Brian L. Strobush, Kingwood, Tex.; Thomas J. Ludemann, Maplewood, and Robert A. Yapel, Oakdale, both of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Mar. 29, 1996, Appl. No. 624,164

Int. Cl.[7] B05D *3/02*

U.S. Cl. 427—379 **40 Claims**



1. A method for evaporating a coating solvent from a coating on a substrate and for reducing the formation of drying mottle as the coating solvent is evaporating, the substrate having a first substrate surface and a second substrate surface, the method comprising the steps of:

(a) applying the coating onto the first substrate surface, the coating having a first coating temperature;

(b) heating the coating with a first drying gas at no faster than a first heat transfer rate, the first drying gas having a first drying gas temperature, the first heat transfer rate being created by a first heat transfer coefficient and a first temperature difference between the first coating temperature and the first drying gas temperature, the first heat transfer rate causing maximum evaporation of the coating solvent yet no more than an acceptable level of drying mottle, the coating being heated predominantly by heat transferred from the first drying gas and through the substrate second surface; and

(c) heating the coating with a second drying gas at no faster than a second heat transfer rate greater than the first heat transfer rate after a first portion of the coating solvent has evaporated, the coating having a second coating temperature just before being heated by the second drying gas, the second drying gas having a second drying gas temperature, the second heat transfer rate being created by a second heat transfer coefficient and a second temperature difference between the second coating temperature and the second drying gas temperature, the second heat transfer rate causing a maximum evaporation of the coating solvent yet no more than an acceptable level of drying mottle, at least one of the second heat transfer coefficient and the second temperature difference being greater than the respective first heat transfer coefficient and first tempera-

ture difference, the coating being heated predominantly by heat transferred from the drying gas and through the substrate second surface.

6,015,594

METHOD AND APPARATUS FOR FORMING A FILM BY SPUTTERING PROCESS

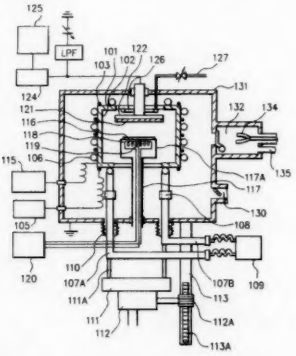
Toshiaki Yoshikawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of application No. 08/201,099, Feb. 24, 1994, Pat. No. 5,449,444, which is a continuation of application No. 07/946,461, filed as application No. PCT/JP92/00333, Mar. 19, 1992, abandoned. This application Jun. 7, 1995, Appl. No. 480,343.

Claims priority, application Japan, Mar. 20, 1991, 3-080367

Int. Cl.[7] B05D *3/00;* **C23C** *14/34*

U.S. Cl. 427—398.1 **6 Claims**



1. A film-forming method for forming a deposited film on a substrate arranged in a film-forming chamber employing plasma generated by a raw material gas in said film-forming chamber, said film-forming chamber comprising (i) a deposition preventive member arranged in said film-forming chamber such that said deposition preventive member prevents a film from depositing on an inner wall face of said film-forming chamber during the formation of said deposited film on said substrate and (ii) a heating means and (iii) a cooling means which are alternately arranged on a face side of said deposition preventive member (i) opposed to said inner wall face of said film-forming chamber; said method comprising the steps of:

(a) evacuating the inside of said film-forming chamber and subjecting said deposition preventive member to heat treatment by heating said deposition preventive member by means of said heating means prior to commencing formation of said deposited film, and

(b) forming said deposited film on said substrate maintained at a desired temperature while cooling said deposition preventive member by said cooling means to prevent said deposition preventive member from releasing unnecessary components contained in said deposition preventive member due to heat radiated from said substrate and said plasma.

6,015,595

MULTIPLE SOURCE DEPOSITION PLASMA APPARATUS

John T. Felts, 2624 Calhoun St., Alameda, Calif. 94501

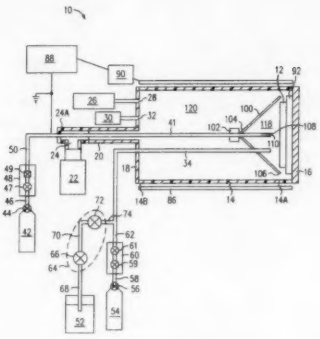
Filed May 28, 1998, Appl. No. 86,715

Int. Cl.[7] B05D *1/02*

U.S. Cl. 427—446 **23 Claims**

1. An apparatus for forming a film on a substrate comprising:

a first gas inlet;



an insert attached to said first gas inlet, said insert comprising a deposition source material;

a chamber comprising an electrically insulating material; and

an electrode adjacent an exterior surface of said chamber.

6,015,596

FLUORINE-CONTAINING SILICON NETWORK POLYMER, INSULATING COATING THEREOF, AND ELECTRONIC DEVICES THEREWITH

Takao Miwa, Hitachinaka; Akira Watanabe, Sendai; Osamu Ito, Sendai, and Minoru Matsuda, Sendai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP96/01107, § 371 Date Oct. 27, 1997, § 102(e) Date Oct. 27, 1997, PCT Pub. No. WO96/34034, PCT Pub. Date Oct. 31, 1996

PCT Filed Apr. 24, 1996, Appl. No. 945,472

Claims priority, application Japan, Apr. 25, 1995, 7-099228; Jul. 18, 1995, 7-181416

Int. Cl.[7] C08J *7/18*

U.S. Cl. 427—489 **32 Claims**

1. A fluorine-containing silicon network polymer represented by the following general formula:

where, R is an aromatic group or alkyl group containing at least one fluorine, and n is an integer, the polymer having a molecular weight of 1,000 to 100,000.

6,015,597

METHOD FOR COATING DIAMOND-LIKE NETWORKS ONTO PARTICLES

Moses M. David, Woodbury, Minn., assignor to 3M Innovative Properties Company, St. Paul, Minn.

Filed Nov. 26, 1997, Appl. No. 979,072

Int. Cl.[7] C23C *16/50;16/26;* **B22F** *1/02*

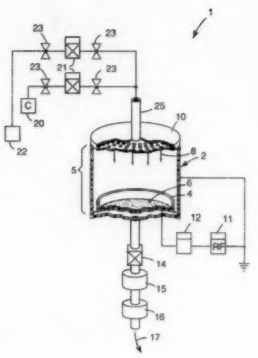
U.S. Cl. 427—577 **14 Claims**

1. A method of depositing a diamond-like network onto particles comprising:

providing a capacitively coupled reactor system, comprising two electrodes in an evacuable reaction chamber;

placing a multiplicity of particles on or near one of the electrodes;

evacuating the chamber;



applying radio frequency power to one of the electrodes, and grounding the other electrode;

introducing a carbon-containing source into the reaction chamber thereby forming a plasma comprising reactive species in proximity to the multiplicity of particles and further forming ion sheaths around the electrodes;

agitating the multiplicity of particles in such a manner as to expose their surfaces to the reactive species in the plasma while keeping the particles substantially within an ion sheath so that depositing the diamond-like network onto the particles.

6,015,598

THREE-DIMENSIONAL STRUCTURE COVERED WITH A PLANAR FILM TAPE

Javier M. Del Rio-Sandoval, Calzada de la Viga No. 680, Col., Zapotla, Mexico, 08610

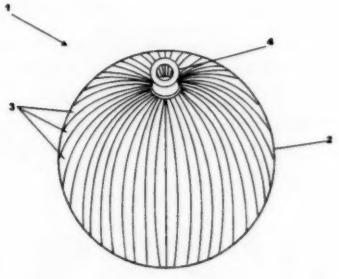
PCT No. PCT/MX96/00015, § 371 Date May 19, 1998, § 102(e) Date May 19, 1998, PCT Pub. No. WO97/04693, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 30, 1996, Appl. No. 257

Claims priority, application Mexico, Jul. 31, 1995, 953299

Int. Cl.[7] **A47G** *33/04;* **G09F** *17/00;19/00*

U.S. Cl. 428—7 **12 Claims**



1. A three-dimensional structure, covered with a continuous strip of flat film, characterized by comprising a core or main body; a continuous strip of flat film wound several times around said core, so that it is completely covered in a uniform, regular, and continuous fashion, by a longitudinal overlapping of the edges of the film; and, a fastening device, located at the upper part of said core.

6,015,599

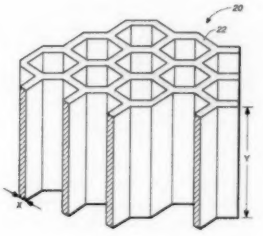
HIGH VERTICAL ASPECT RATIO THIN FILM STRUCTURES

Christopher G. Keller, Albany, and Mauro Ferrari, Walnut Creek, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Division of application No. 08/207,459, Mar. 7, 1994, Pat. No. 5,660,680. This application Jun. 6, 1995, Appl. No. 479,669. This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B32B** *3/12*

U.S. Cl. 428—34.4 **14 Claims**



1. A free standing thin film structure, comprising: a network of ribs each having a thickness and wherein an extent of said thin film structure in any direction is greater than about twice the thickness of any of said ribs.

6,015,600

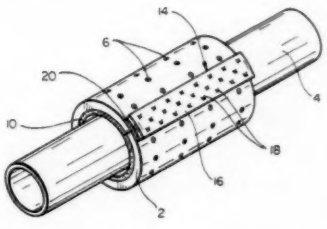
HEAT-RECOVERABLE ARTICLE

Walter J. Greuel, Jr., 1588 Country Vistas La., Bonita, Calif. 91902; George Pieslak, 199 Heather Dr., Atherton, Calif. 94025; Efrain Renteria, Olas Altas #934, Playas de Coronado Tijuana, Baja California Norte, Mexico; Stanley Simpson, 204-D Lakeview Ter., Montgomery, Tex. 77356; Jan L. Vansant, Minneveld, 2, B-3000 Leuven, Belgium, and Barnie A. Wallace, Jr., 1584 Country Vistas La., Bonita, Calif. 91902

Division of application No. 08/290,972, Oct. 25, 1994, Pat. No. 5,660,660, which is a continuation-in-part of application No. 08/156,518, filed as application No. PCT/US93/01592, Feb. 24, 1993, abandoned, and a continuation of application No. 07/841,391, Feb. 25, 1992, abandoned. This application Aug. 26, 1997, Appl. No. 918,825.

Int. Cl.[7] **B65B** *53/02*

U.S. Cl. 428—34.9 **15 Claims**



1. An article comprising a polymeric element which is a continuous extruded polymeric sheet, said element comprising

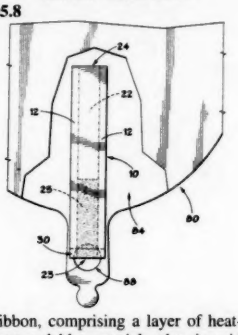
(1) a first surface which has an embossed pattern which (a) is over at least part of the surface, and (b) undergoes a visible change when the element is heated such that the embossed surface becomes substantially smooth to indicate recovery; and

(2) a second surface which is not embossed.

6,015,601
CURLING RIBBON

Arturo Verduzco Garcia, Jalisco, Mexico, assignor to Convertidora Industrial S.A. de C.V., Jal., Mexico

Division of application No. 08/564,486, Nov. 29, 1995, Pat. No. 5,860,441. This application Aug. 7, 1998, Appl. No. 131,188.
Int. Cl.[7] B29D *22/00*
U.S. Cl. 428—35.8 **9 Claims**

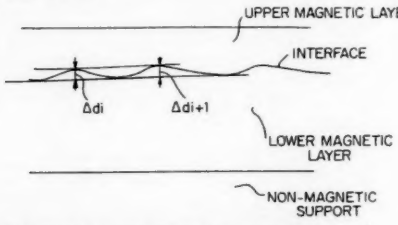


1. A curling ribbon, comprising a layer of heat-stable material and a layer of heat-sealable material, wherein said layer of heat-stable material is laminated to said layer of heat-sealable material to produce a laminated film wherein said layer of heat-stable material tends to curl around said layer of heat-sealable material.

6,015,602
MAGNETIC RECORDING MEDIUM

Kiyomi Ejiri; Hiroo Inaba; Shinji Saito, and Satoru Hayakawa, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of application No. 07/873,201, Apr. 24, 1992, Pat. No. 5,645,917, which is a continuation-in-part of application No. 07/822,975, Jan. 21, 1992, Pat. No. 5,258,223, and a continuation-in-part of application No. 08/761,084, Dec. 4, 1996, Pat. No. 5,756,148, which is a continuation of application No. 07/873,201, Apr. 24, 1992, Pat. No. 5,645,917, which is a continuation-in-part of application No. 07/822,975, Jan. 21, 1992, Pat. No. 5,258,223. This application Apr. 25, 1997, Appl. No. 846,032.
Claims priority, application Japan, Jan. 21, 1991, 3-019221; Apr. 25, 1991, 3-121873; Apr. 25, 1991, 3-121875; Jul. 15, 1991, 3-198309; Jan. 8, 1992, 4-18416; Jan. 10, 1992, 4-21782
Int. Cl.[7] G11B *5/66;* **B32B** *3/10*
U.S. Cl. 428—141 **14 Claims**

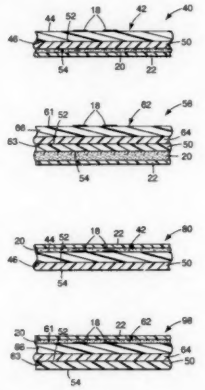


1. A magnetic recording medium, comprising:
a support;
a lower layer disposed over the support and comprising a powder containing a non-magnetic substance and a magnetic substance dispersed in a binder;
an upper magnetic layer comprising a ferromagnetic powder and a binder disposed over the lower layer;
wherein said upper magnetic layer has a dry thickness of 1.0 μm or less and a coercive force (Hc) of from 1,200 to 3,000 Oe, and said lower layer comprises the non-magnetic substance in an amount of 100 parts or more by weight per 100 parts by weight of the magnetic substance.

6,015,603
IMAGING MEDIUM COMPRISING POLYVINYL CHLORIDE, METHOD OF IMAGING SAID MEDIUM, AND IMAGE-BEARING MEDIUM

David T. Ou-Yang, Woodbury, Minn., assignor to 3M Innovative Properties Company, St. Paul, Minn.

Filed Apr. 30, 1997, Appl. No. 847,136
Int. Cl.[7] B32B *3/00*
U.S. Cl. 428—195 **54 Claims**



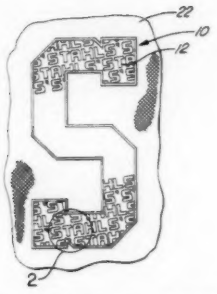
1. An imaging medium comprising:
(a) a receptor layer, wherein the receptor layer comprises a blend of about 5 to about 65 percent by weight first polymer(s) and about 35 to about 95 percent by weight of a second polymer(s), wherein the weight percentages of the first polymer(s) and the second polymer(s) are based upon the total weight of the receptor layer, wherein each first polymer independently comprises the polymerization product of a composition comprising (i) ethylene, (ii) monomer(s) selected from the group consisting of vinyl acetate, vinyl acrylate, vinyl carboxylic acid(s) and mixtures thereof, and (iii) optionally an anhydride(s), and each second polymer independently comprises the polymerization product of a composition comprising (i) ethylene, (ii) monomer(s) selected from the group consisting of vinyl acetate, vinyl acrylate, and mixtures thereof, and (iii) carbon monoxide, wherein the receptor layer has a melt index of at least about 2.5 grams/10 minutes; and
(b) a polyvinyl chloride backing layer bonded to the receptor layer;
wherein the composition of the receptor layer is selected such that the T-peel adhesion of the receptor layer to the polyvinyl chloride backing layer is at least about 358 g/cm, and such that at least one of the following is true:
(i) the Taber abrasion resistance test value for an image electrophotographically formed on the receptor layer with a liquid toner is at least about 6;
(ii) the Taber abrasion resistance test value for an image electrophotographically formed on the receptor layer with a dry thermoplastic toner is at least about 6.

6,015,604
IMPRESSED EMBLEM AND METHOD

Brett A. Stahl, Harrison Township, Mich., assignor to Stahls', Inc., St. Clair Shores, Mich.

Division of application No. 08/595,639, Feb. 2, 1996, Pat. No. 5,902,667. This application Jul. 20, 1998, Appl. No. 119,275.
Int. Cl.[7] B32B *9/00*
U.S. Cl. 428—195 **5 Claims**

1. An identification emblem for affixation to a garment whose wearer is to be identified wherein the emblem has indicia thereon for identifying the emblem itself, comprising:
a thermoplastic layer configured as an identification emblem;



an adhesive layer overlying one side of the thermoplastic layer for affixing the thermoplastic layer to a garment whose wearer is to be identified;

the opposite side of said thermoplastic layer being exposed to view and having an embossed or debossed indicia thereon for identifying the emblem itself; and

said embossed or debossed indicia in the thermoplastic layer is readable when a garment with the emblem attached is within about four feet of the viewer but not substantially therebeyond, whereby said indicia may identify the emblem itself without interfering with the identification function or aesthetic appearance of the emblem.

6,015,605

FILAMENT NONWOVEN FABRIC AND ABSORBENT ARTICLE USING THE SAME

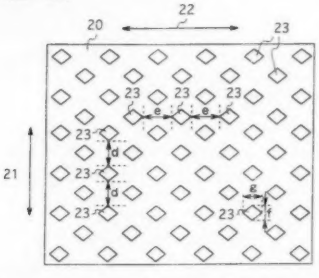
Yoshimi Tsujiyama; Toshikatsu Fujiwara, and Shingo Horiuchi, all of Moriyama, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of application No. PCT/JP98/02577, Jun. 10, 1998. This application Feb. 8, 1999, Appl. No. 246,373.

Claims priority, application Japan, Jun. 11, 1997, 9-153901

Int. Cl.[7] **B32B** *3/00*

U.S. Cl. 428—195 **14 Claims**



1. A filament nonwoven fabric comprising thermoplastic fibers with a fineness of 0.1 to 10 d/f, having a basis weight of 5 to 35 g/m^2, and having thermally press bonded portions, in which the conditions (A), (B), and (C) below are satisfied:

(A) the area rate of the thermally press bonded portions being from 5 to 25%;

(B) X≦2.0 (mm)

X: the average value of the distance between adjacent thermally press bonded portions in the mechanical direction of the nonwoven fabric;

Y≦2.5 (mm)

Y: the average value of the distance between adjacent thermally press bonded portions in the direction perpendicular to the mechanical direction of the nonwoven fabric; and

(C) the average value of the ratio between the maximum diameters of the thermally press bonded portions satisfying

1≦y/x≦15,

wherein

x: the average value of the maximum diameter of the thermally press bonded portions in the mechanical direction of the nonwoven fabric; and

y: the average value of the maximum diameter of the thermally press bonded portions in the direction perpendicular to the mechanical direction of the nonwoven fabric.

6,015,606

ADHESIVE-COATED FILM

Hidetoshi Abe, Tendo, Japan, assignor to 3M Innovative Properties Company, St. Paul, Minn.

PCT No. PCT/US95/11767, § 371 Date Apr. 7, 1997, § 102(e) Date Apr. 7, 1997, PCT Pub. No. WO96/11116, PCT Pub. Date Apr. 18, 1996

PCT Filed Sep. 15, 1995, Appl. No. 817,323

Claims priority, application Japan, Oct. 6, 1994, 6-243079

Int. Cl.[7] **C09J** *7/02*

U.S. Cl. 428—214 **5 Claims**

1. An adhesive film for decoration comprising an adhesive coated on a surface of a film substrate, wherein said adhesive has elastic microspheres,

wherein said elastic microspheres have an elastic modulus of from 1×10^4 to 1×10^7 dyn/cm^2; a volume average diameter of from 10 to 100 μm;

wherein 30 to 900 parts by weight of said elastic microspheres are added to 100 parts by weight of said adhesive; and

wherein a mixture of said adhesive and said elastic microspheres is coated in a coating weight within the range of about 4 to 40 g/m^2; wherein upon application of the Escapability of Bubbles Test, air bubbles are completely pushed out from under the adhesive film, and wherein upon application of the Smoothness of Film Surface Test, the shapes of the elastic microspheres are not recognized.

6,015,607

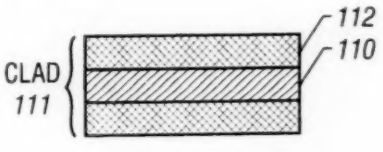
FLEXIBLE LAMINATES AND METHOD OF MAKING THE LAMINATES

James Fraivillig, Seabrook, Tex., assignor to Fraivillig Materials Company, Austin, Tex.

Continuation of application No. 08/495,945, Jun. 28, 1995, abandoned. This application Apr. 14, 1997, Appl. No. 834,105.

Int. Cl.[7] **H05K** *1/03;* **B32B** *27/28*

U.S. Cl. 428—214 **7 Claims**



1. A flexible circuit, comprising:

a flexible substrate comprising a polyimide, polyester or polyetherimide, the flexible substrate having a thickness selected to enable flexure consistent with use in the flexible circuit;

an adhesive layer on the flexible substrate, the adhesive layer consisting of siloxane polyetherimide copolymer as the only polymeric component; and

a metal foil layer on the adhesive layer.

6,015,608

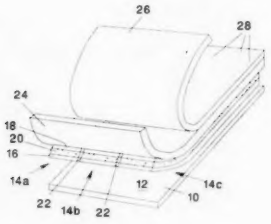
LIQUID ABSORBENT PAD WITH ANTI-GEL-BLOCK LAMINATE

Evan E. Koslow, Weston, Conn., assignor to Koslow Technologies Corporation, Orange, Conn.

Filed Jun. 3, 1998, Appl. No. 90,011

Int. Cl.[7] A61F *13/15*

U.S. Cl. 428—304.4 **17 Claims**



1. A liquid absorbent pad which comprises:

an outer layer of a substantially liquid-impervious material having an outer surface and an inner surface;

a plurality of liquid-absorbent laminate segments positioned on the inner surface of said liquid impervious material and spaced from one another, each of said laminate segments comprising a liquid permeable first substrate web having a first surface upon which is deposited a particulate, substantially non-gelling, liquid absorbent and particles of a thermoplastic binder fused to both of said particulate liquid absorbent and said first surface;

a liquid-permeable acquisition layer positioned over said plurality of laminate segments; and

liquid-impervious means bonding the outer layer and liquid acquisition layers together with the plurality of liquid-absorbent laminate segments therebetween, the liquid impervious bonding means disposed for preventing transfer of liquid-absorbent particles between adjacent laminate segments.

6,015,609

PROCESS FOR MANUFACTURE OF A POROUS POLYMER FROM A MIXTURE

Hassan Chaouk, Brighton; Gordon Francis Meijs, Murrumbeena, and Bronwyn Glenice Laycock, Heidelberg Heights, all of Australia, assignors to Navartis AG, Basel, Switzerland, and Commonwealth Scientific & Industrial Research Organisation, Campbell, Australia

PCT No. PCT/EP97/01408, § 371 Date May 10, 1999, § 102(e) Date May 10, 1999, PCT Pub. No. WO97/35904, PCT Pub. Date Oct. 2, 1997

PCT Filed Mar. 20, 1997, Appl. No. 155,548

Claims priority, application Australia, Apr. 4, 1996, PN9146; Germany, Sep. 30, 1996, 96810644

Int. Cl.[7] B32B *5/14*; **C08K** *5/00*

U.S. Cl. 428—308.4 **19 Claims**

1. A process for the production of a porous polymer comprising the steps of:

i) forming a mixture comprising a polymerizable component and an organic solvent wherein the polymerizable component comprises at least one macromonomer having at least one perfluoropolyether unit;

ii) polymerizing said mixture wherein immediately after the polymerization of said mixture at least a substantial proportion of said organic solvent is in the form of a discrete phase and wherein said discrete organic solvent phase forms an interpenetrating network throughout the mixture or is dispersed throughout the mixture; and

iii) removing the discrete organic solvent phase.

6,015,610

VERY THIN HIGHLY LIGHT REFLECTANT SURFACE AND METHOD FOR MAKING AND USING SAME

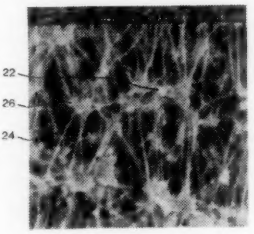
Raymond B. Minor, Elkton, Md.; Gordon L. McGregor, Landenberg, Pa.; Huey Shen Wu, Newark, and Daniel J. Lash, Bear, both of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of application No. 08/910,096, Aug. 12, 1997, which is a continuation of application No. 08/562,651, Nov. 27, 1995, Pat. No. 5,781,342, which is a continuation-in-part of application No. 08/369,850, Jan. 6, 1995, Pat. No. 5,596,450. This application Nov. 14, 1997, Appl. No. 970,490.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B32B *3/26*

U.S. Cl. 428—315.7 **15 Claims**



1. A light reflective material comprising

an expanded polytetrafluoroethylene having a micro structure of polymeric nodes, fibrils, and voids;

a coating on the nodes and fibrils of the expanded polytetrafluoroethylene comprising particles with an index of refraction greater than 1.5;

wherein the light reflective material has a total thickness of no more than 0.3 mm; and

wherein the light reflective material provides diffuse reflectivity of at least 96% of visible light with a wavelength between at least 450 to 750 nm striking the reflectant material.

6,015,611

ADVANCED POLYMER WOOD COMPOSITE

Michael J. Deaner, Osceola, Wis.; Joseph Puppin, Bayport, and Kurt E. Heikkila, Circle Pines, both of Minn., assignors to Andersen Corporation, Bayport, Minn.

Continuation of application No. 08/543,959, Oct. 17, 1995, Pat. No. 5,827,607, which is a continuation of application No. 08/224,396, Apr. 7, 1994, abandoned, which is a continuation of application No. 07/938,364, Aug. 31, 1992, abandoned. This application Oct. 26, 1998, Appl. No. 178,952.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B32B *23/00*

U.S. Cl. 428—326 **50 Claims**

1. A composite thermoplastic pellet, capable of formation into a structural profile or member, which pellet consists essentially of a thermoplastic cylindrical extrudate having a width of about 1 to 5 mm, a length of about 1 to 10 mm, the thermoplastic pellet composite composition consisting essentially of:

(a) about 40 to 70 wt. % a thermoplastic polymer comprising vinyl chloride; and

(b) about 30 to 50 wt. % of wood fiber having a minimum aspect ratio of about 1.8 to provide structural properties to the composite;

wherein the polymer wood fiber are mixed at elevated temperature and pressure such that the fiber comprises less than about 8 wt-% water, the pellet comprises an intimate admixture of wood fiber dispersed throughout the continuous thermoplastic polymer phase, the pellet is a recyclable thermoplastic and the composite has a Young's modulus of at least about 800,000 psi.

6,015,612

POLYMER WOOD COMPOSITE

Michael J. Deaner, Osceola, Wis.; Joseph Puppin, Bayport, and Kurt E. Heikkila, Circle Pines, both of Minn., assignors to Andersen Corporation, Bayport, Minn.

Continuation of application No. 09/178,953, Oct. 26, 1998, which is a continuation of application No. 08/543,959, Oct. 10, 1995, Pat. No. 5,827,607, which is a continuation of application No. 08/224,396, Apr. 7, 1994, abandoned, which is a continuation of application No. 07/938,364, Aug. 31, 1992, abandoned. This application May 4, 1999, Appl. No. 304,351. This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B32B** *5/16*

U.S. Cl. 428—326 **18 Claims**

1. A thermoplastic polymer composite composition capable of formation into a structural profile or member, the thermoplastic composite composition comprising:

(a) an effective amount, sufficient to form a continuous phase in the composite, of a thermoplastic polymer composition comprising vinyl chloride; and

(b) an effective amount of wood fiber having a minimum aspect ratio of about 2 to provide structural properties to the composite;

wherein the polymer and wood fiber are mixed at elevated temperature and pressure such that the composition comprises less than about 8 wt-% water, the composition comprises an intimate admixture of wood fiber dispersed throughout the continuous thermoplastic polymer phase such that the polymer wets and penetrates into the interior volume of wood fiber cells, the composition is a recyclable thermoplastic and the composite has a Young's modulus of at least about 500,000 psi.

6,015,613

CORROSION INHIBITING MULTILAYER COATING

Patrick John Kinlen, 1348 Remington Oaks Ter., Fenton, Mo. 63026; David Charles Silverman, 14314 Strawbridge Ct., Chesterfield, Mo. 63017, and Christopher John Hardiman, 20 Garden St., Farmington, Conn. 06032

PCT No. PCT/US94/08259, § 371 Date Mar. 11, 1996, § 102(e) Date Mar. 11, 1996, PCT Pub. No. WO95/03136, PCT Pub. Date Feb. 2, 1995

Continuation-in-part of application No. 08/096,661, Jul. 23, 1993, Pat. No. 5,532,025. This PCT application Jul. 22, 1994, Appl. No. 591,439.

Int. Cl.[7] **B32B** *15/04;15/08;* **B05D** *5/00*

U.S. Cl. 428—332 **18 Claims**

1. A metal/polymer laminate having a corrosion resistant metal surface, the laminate comprising a metal film having a thickness of about 25 micrometers or less, the film having a coated surface and an opposite surface from the coated surface, the coated surface being coated with a coating comprising an intrinsically conducting polymer in a non-conducting matrix, which coating inhibits corrosion of the opposite surface of the metal film.

6,015,614

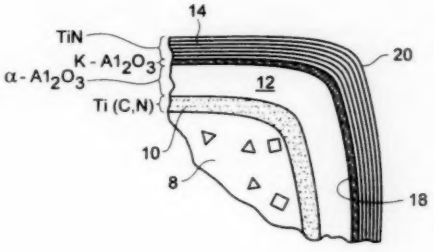
CEMENTED CARBIDE BODY WITH HIGH WEAR RESISTANCE AND EXTRA TOUGH BEHAVIOR

Sakari Ruppi, Fagersta, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Nov. 3, 1997, Appl. No. 962,684

Int. Cl.[7] **C23C** *16/30*

U.S. Cl. 428—335 **10 Claims**



1. A coated cemented carbide body comprising a substrate of a cemented carbide, a layer of Al_2O_3 and an outer layer of wet blasted TiN at least 4 μm in thickness, the outer layer comprising a multilayer of TiN/TiC.

6,015,615

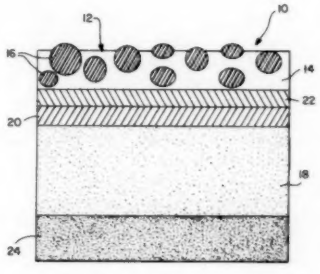
MATTE FINISH RELEASE COMPOSITION, LINERLESS LABELS INCORPORATING THE RELEASE COMPOSITION AND METHOD FOR MAKING SAME

Michael Sanchez, Grand Island; Khaled M. Khatib, Youngstown, and David K. Rice, II, Tonawanda, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Division of application No. 08/476,868, Jun. 7, 1995. This application May 19, 1997, Appl. No. 858,375.

Int. Cl.[7] **B32B** *7/12*

U.S. Cl. 428—352 **23 Claims**



1. A linerless label comprising:

a substrate having front and back sides;

a silicon release layer disposed on the front side of said substrate, said release layer including a crosslinked silicon polymer having microparticles of a polymeric wax at least partially embedded therein, wherein at least some of said microparticles are exposed from the surface of said layer a distance sufficient to cause incidental light to scatter upon reflection giving the layer a matte finish, and wherein the composition of said release layer is selected to enable the layer to effectively function as a release for a pressure sensitive adhesive; and

a pressure sensitive adhesive layer disposed on the back side of said substrate.

6,015,616
DRAWN POLYESTER YARN HAVING A HIGH TENACITY, A HIGH MODULUS AND A LOW SHRINKAGE

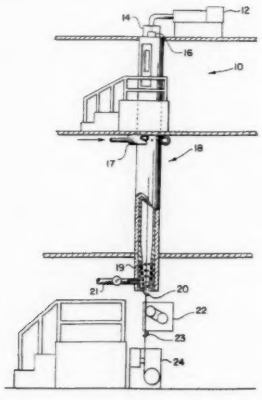
F. Holmes Simons, and Ron L. Griffith, both of Charlotte, N.C., assignors to Arteva North America S.A.R.L., Zurich, Switzerland

Continuation of application No. 08/378,158, Jan. 25, 1995, abandoned, which is a continuation of application No. 08/072,652, Jun. 4, 1993, abandoned, which is a continuation of application No. 07/522,445, May 11, 1990, abandoned. This application Feb. 20, 1996, Appl. No. 719,135.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] D02G *3/00*

U.S. Cl. 428—364 **6 Claims**



1. A drawn yarn being characterized by:

an initial secant modulus greater than 150 grams per denier/100%, the initial secant modulus being determined by passing a line through 0.5% and 1.0% elongation points on the yarn's stress-strain curve;

a polyester polymer having at least 85% of an ester of terephthalic acid and ethylene glycol; and

an intrinsic viscosity of the starting polyester polymer being less than 1.0.

6,015,617
ETHYLENE POLYMER HAVING IMPROVING SEALING PERFORMANCE AND ARTICLES FABRICATED FROM THE SAME

Rexford A. Maugans; Ed N. Knickerbocker, both of Lake Jackson; Rebecca J. Sawchuk, Houston; Alan R. Whetten, Lake Jackson; Ronald P. Markovich, Houston, and Pak-Wing S. Chum, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Provisional application No. 60/050,279, Jun. 20, 1997, abandoned. This application Jun. 5, 1998, Appl. No. 92,575.

Int. Cl.[7] D02G *3/00*

U.S. Cl. 428—364 **14 Claims**

1. A fiber having a diameter in a range of from 0.1 to 50 deniers which is prepared from a polymer blend, wherein the polymer blend comprises:

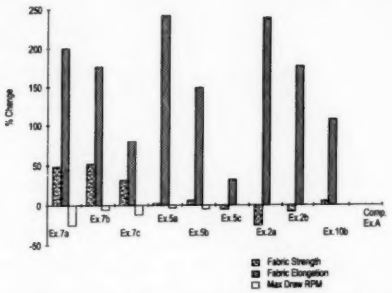
A. from 0.5 percent to 25 weight percent (by weight of the polymer blend) of a first polymer which is a homogeneous ethylene/α-olefin interpolymer having:

i. a melt index of from 0.5 to 100 gram/10 minutes,

ii. a density of from 0.850 to 0.920 gram/centimeters^3, and

B. a second polymer which is an ethylene homopolymer or an ethylene/α-olefin interpolymer having:

i. a melt index of from 0.5 to 500 gram/10 minutes, and



ii. a density which is at least 0.01 gram/centimeters^3 greater than the density of the first polymer, wherein the fiber is bondable at a temperature of less than 165° C.

6,015,618
COMPOSITE YARN COMPRISED OF CHAIN STITCH YARN AND INLAY YARN

Hajime Orima, Sakai-machi, Japan, assignor to Firster Co., Ltd., Sakai-Machi, Japan

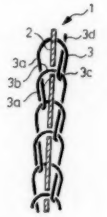
PCT No. PCT/JP95/00745, § 371 Date Oct. 18, 1996, § 102(e) Date Oct. 18, 1996, PCT Pub. No. WO95/29278, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 17, 1995, Appl. No. 727,620

Claims priority, application Japan, Apr. 21, 1994, 6-083172; Apr. 21, 1994, 6-083194

Int. Cl.[7] D02G *3/00*

U.S. Cl. 428—373 **8 Claims**



1. A composite yarn comprising:

a chain stitch yarn knitted with a non-stretchable yarn, to form a series of loops with the non-stretchable yarn along a length of the composite yarn; and

at least one stretchable inlay yarn inserted into the series of loops of the chain stitch yarn,

wherein the non-stretchable yarn is a soluble yarn.

6,015,619
FORMED GLASS SHEET HAVING CONTROLLED EDGE STRESSES

James P. Schnabel, Jr., Maumee; Donivan M. Shetterly, Toledo, and Robert E. Malby, Jr., Wayne, all of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

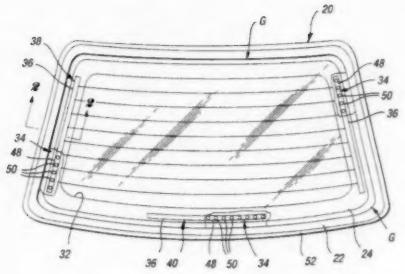
Division of application No. 08/874,831, Jun. 13, 1997, Pat. No. 5,865,866, which is a division of application No. 08/510,591, Aug. 2, 1995, Pat. No. 5,679,124. This application Aug. 24, 1998, Appl. No. 139,220.

Int. Cl.[7] B32B *17/100*

U.S. Cl. 428—410 **7 Claims**

1. A glass sheet that has been formed while hot and subsequently cooled, comprising:

an edge having a net inner band tension with a maximum value of less than 60 Kg/cm^2; and



the edge having a localized area that is less than the total extent of the edge and that has an increased surface compression provided by increased cooling thereof as compared to the rest of the edge so the surface compression of the localized area is greater and deeper than would be present without such increased cooling of the localized area.

6,015,620

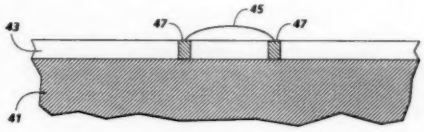
COATED RECORDING SHEETS

William M. Schwarz, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 19, 1994, Appl. No. 325,914

Int. Cl.[7] **B41M** *5/00*

U.S. Cl. 428—411.1 **38 Claims**



1. A recording sheet which comprises a substrate and an image receiving coating situated on at least one surface of the substrate, said coating comprising water and a surfactant capable of exhibiting a liquid crystalline phase in water at a temperature of about 25° C. or higher, said coating containing the water and surfactant in relative concentrations such that upon addition of water to the coating, the surfactant undergoes a phase change, thereby increasing the viscosity of the coating, wherein the recording sheet is suitable for receiving printed images, said substrate being selected from the group consisting of paper and transparent polymeric materials, said image receiving coating being suitable for receiving high quality images of an aqueous ink, said images exhibiting sharp line edges.

6,015,621

ULTRAVIOLET DOSIMETER FILM

Regina Lischewski, Wolfen; Ursula Sell, Pohritzsch; Jörg Marx, Dessau, and Uwe Gohs, Dresden, all of Germany, assignors to Syntec Gesellschaft für Chemie und Technologie der Informationsaufzeichnung mbH, Germany

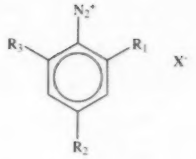
Filed Apr. 28, 1998, Appl. No. 67,969

Claims priority, application Germany, May 9, 1997, 197 19 721

Int. Cl.[7] **G03B** *11/00*

U.S. Cl. 428—411.1 **6 Claims**

1. An ultraviolet-sensitive dosimeter material comprising at least one diazonium compound featuring absorption in the ultraviolet wavelength range, said diazonium compound being formed by a diazonium salt of the formula:



in which R_1 is selected from the group consisting of H, halogen, C_1–C_5 alkyl, C_1–C_5 alkoxy and aryloxy, R_2 is selected from the group consisting of H, halogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, aryloxy, $NR'HR''$ (R', R'' being the same or differing alkyl compounds or heterocyclic amines), and $COOR_4$ (where R_4 is C_1–C_5 alkyl), R_3 is selected from the group consisting of H, C_1–C_5 alkoxy, and X^- is selected from the group consisting of diazo process anions and perfluorinated aliphatic or aromatic anions, and a binder.

6,015,622

SEMI-FINISHED SURFACE-CLADDING COMPONENT

Hans Peter Böe, Speldorfer Strasse 17-19, D-46049, Oberhausen, Germany

PCT No. PCT/EP97/00656, § 371 Date Oct. 9, 1997, § 102(e) Date Oct. 9, 1997, PCT Pub. No. WO97/30246, PCT Pub. Date Aug. 21, 1997

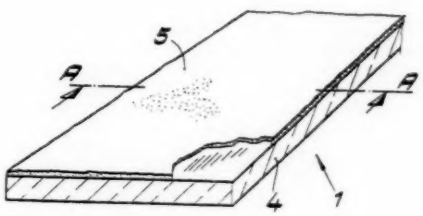
PCT Filed Feb. 13, 1997, Appl. No. 930,977

Claims priority, application Germany, Feb. 16, 1996, 196 05 806; Aug. 10, 1996, 196 32 353

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B32B** *17/06;* **E04C** *1/00*

U.S. Cl. 428—426 **14 Claims**



1. A construction component for cladding of a structural surface, consisting of

a glass pane and a layer of bonding mortar on one side of the glass pane, which bonding mortar consists of a fine-particle neutral aggregate and cement and is gauged with an aqueous dispersion of a polyacrylic acid derivative,

whereby the polyacrylic acid derivative has a logarithmic decrement determined in accordance to ISO 537, which has a maximum at Celsius temperatures below 0° C., and the bonding mortar is hardened on the glass pane with a deficiency of hydration water,

whereby a bond with the surface to be covered can be established through the contact of the bonding mortar layer with gauged and setting concrete of the surface or with a tile adhesive.

6,015,623

UTENSIL FOR PERSONAL CARE

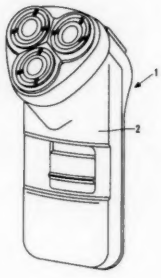
Ytsen Wielstra, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1997, Appl. No. 935,589

Claims priority, application European Pat. Off., Sep. 24, 1996, 96202659

Int. Cl.[7] **B25G** *1/10;* **B32B** *27/08*

U.S. Cl. 428—447 **7 Claims**



1. A utensil for personal care, which is provided with a coating of lacquer having improved resistance to emollients, wherein said coating of lacquer contains a network of a hydrolytically condensed organosilane compound.

6,015,624

INK-RECEPTIVE SHEET

Donald J. Williams, Austin, Tex., assignor to 3M Innovative Properties Company, St. Paul, Minn.

Continuation-in-part of application No. 08/690,891, Aug. 2, 1996, abandoned, which is a continuation-in-part of application No. 08/395,999, Feb. 28, 1995, abandoned. This application Dec. 5, 1997, Appl. No. 986,562.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B41M** *5/00*

U.S. Cl. 428—500 **18 Claims**

1. An ink-receptive sheet comprising a substrate and an ink-receptive coating, said coating comprising a blend of polymers, said blend comprising from about 35% to about 85% by weight of a hydrophilic liquid absorbent polymer and from about 15% to about 65% by weight of a polyethylene-acrylic acid copolymer.

6,015,625

ADHESIVE RESIN COMPOSITION AND LAMINATE MADE USING THE SAME AS ADHESIVE LAYER

Kenichi Morizono; Keiji Okada, both of Kuga-gun; Hiromi Shigemoto, and Hideshi Kawachi, both of Ichihara, all of Japan, assignors to Mitsui Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP98/00213, § 371 Date Sep. 24, 1998, § 102(e) Date Sep. 24, 1998, PCT Pub. No. WO98/32809, PCT Pub. Date Jul. 30, 1998

PCT Filed Jan. 27, 1998, Appl. No. 155,208

Claims priority, application Japan, Jan. 27, 1997, 9-012925; Dec. 9, 1997, 9-338346

Int. Cl.[7] **B32B** *27/00*

U.S. Cl. 428—500 **7 Claims**

1. An adhesive resin composition containing at least a partially or wholly graft-modified α-olefin/aromatic vinyl compound random copolymer having a graft quantity of an unsaturated carboxylic acid or its derivative ranging from 0.01 to 30% by weight.

6,015,626

WEATHER-RESISTANT, PLASTICIZER-FREE, DEEP-DRAWABLE FILM

Walter Kopytko, Waldkraiburg, Germany, assignor to Benecke-Kaliko AG, Germany

Continuation of application No. 08/588,860, Jan. 19, 1996, Pat. No. 5,744,249. This application Feb. 19, 1998, Appl. No. 26,317.

Claims priority, application Germany, Oct. 15, 1991, 41 34 111; WIPO, Oct. 14, 1992, EP92/02358

Int. Cl.[7] **B32B** *27/08;* **C08F** *8/00;* **C08L** *45/00;9/00;23/00*

U.S. Cl. 428—516 **21 Claims**

1. A molded film which consists essentially of:

(a) 30–70 wt. % of a semicrystalline ethylene/ propylene/diene terpolymer containing about 56–76 wt. % ethylene, about 15–30 wt. % propylene, and about 9–14 wt. % of a diene and having a melt flow index MFI (230/2.16) of about 5–15 g./10 min. and

(b) 70–30 wt. % of an ethylene or propylene copolymer having a melt-flow index MFI (230/2.16) of greater than 2.5 g./10 min.;

characterized in that the molded film is a weather-resistant, plasticizer-free, deep-drawable film.

6,015,627

MAGNETIC HEAD DRUM AND METHOD OF MANUFACTURING SAME

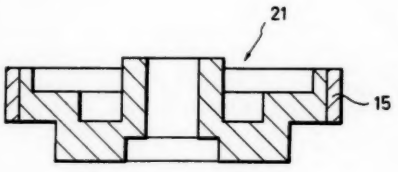
Yasuhiro Hirafune, Saitama, and Akio Kikuchi, Aichi, both of Japan, assignors to Sony Corporation, and Sumitomo Light Metal Industries, Ltd., both of Tokyo, Japan

Continuation of application No. 08/440,697, May 15, 1995, abandoned, which is a continuation-in-part of application No. 08/317,216, Oct. 3, 1994, abandoned, which is a continuation of application No. 07/733,164, Jul. 19, 1991, abandoned. This application Sep. 3, 1997, Appl. No. 922,859.

Claims priority, application Japan, Aug. 3, 1990, 2-006052

Int. Cl.[7] **B22F** *7/04*

U.S. Cl. 428—553 **4 Claims**



1. A magnetic head drum on which a magnetic head for magnetic recording and reproducing is supported, comprising:

an inner body made of an aluminum alloy and having an outer cylindrical circumference; and

a wear-resistant layer of a sintered powdery alloy disposed around said outer circumference of said inner body, said wear-resistant layer integrally formed on said inner body by sintering in place in at least a region for sliding contact between the head drum and an elongate magnetic recording medium, said wear-resistant layer having a thickness of at least 0.2 mm. said sintered powdery alloy comprising a powdery alloy of 17 to 38% of Si particles, 0.5 to 5% of Cu, 0.3 to 5% of Mg by weight, and the remainder of aluminum, said sintered alloy material being completely alloy-coupled to said inner body and thereby exhibiting no defined boundary between the inner body and the wear-resistant layer, said particles of Si of said powdery alloy having an average diameter ranging from 1 to 8 μm, said particles of said powdery alloy having Si particles no larger than 8 μm in diameter.

6,015,628
ORGANIC COMPOSITE COATED STEEL SHEET WITH GOOD PRESS FORMABILITY AND PERFORATION CORROSION RESISTANCE

Kazuya Urata; Naoto Yoshimi; Takahiro Kubota; Masaaki Yamashita, all of Tokyo, and Yasuhiko Haruta, Hiratsuka, all of Japan, assignors to NKK Corporation, Tokyo, Japan

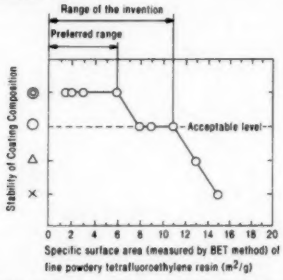
PCT No. PCT/JP96/02156, § 371 Date Jun. 18, 1997, § 102(e) Date Jun. 18, 1997, PCT Pub. No. WO97/04957, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 31, 1996, Appl. No. 809,766

Claims priority, application Japan, Jul. 31, 1995, 7-214063

Int. Cl.[7] B21D *39/00;* **C03C** *27/02;* **B32B** *27/38*

U.S. Cl. 428—623 **33 Claims**


Range of the invention
Preferred range
Acceptable level
Stability of Coating Composition
◎
○
△
×
0 2 4 6 8 10 12 14 16 18 20
Specific surface area (measured by BET method) of fine powdery tetrafluoroethylene resin (m²/g)

1. An organic composite coated steel sheet with press formability and perforation corrosion resistance, which comprises a zinc or zinc alloy plated steel sheet having on at least one of its surfaces a first chromate layer having a coating weight of from 5 to 200 mg/m^2 in terms of metallic chromium, and a second layer of an organic film having a thickness of from 0.1 to 3.0 μm, in that order, and in which said organic film comprises an epoxy resin mixture (i), a lubricant (ii) and a rust preventive additive, in such a ratio by weight, in terms of the non-volatile contents, that the epoxy resin mixture is from 30 to 80% by weight, the lubricant is from 8 to 50% by weight and the rust preventive additive is from 3 to 50% by weight; wherein

(i) is an epoxy resin mixture composed of a base resin (A) as prepared by adding at least one basic nitrogen atom and at least two primary hydroxyl groups to the ends of an epoxy resin, and a curing agent for (A) of a polyisocyanate compound (B), as mixed in a ratio by weight, A/B, of being from 95/5 to 55/45 (in terms of the non-volatile contents); and

(ii) is a composite lubricant composed of a polyethylene wax (C) having a molecular weight of from 700 to 4500 and a softening point of from 100 to 140° C. as prepared through coordination-anionic polymerization using a Ziegler catalyst, and a powder of a fluorine resin (D), as mixed in a ratio by weight, C/D, of being from 10/90 to 90/10, wherein said fluorine resin (D) to be in the organic film is a powder of a tetrafluoroethylene resin having a mean particle size of from 0.1 to 5 μm that satisfies the following conditions (a) and (b):

(a) When tested in a method for testing its flow properties with a capillary rheometer under the conditions mentioned below, in accordance with JIS K7199, the apparent melt viscosity and the apparent rate of shear of the resin powder satisfy the following equation (1):

$$\log \eta \leqq A - B \log \gamma \quad (1)$$

in which:

A is 5.45;

B is 0.64;

η is the apparent melt viscosity (poise) of the resin, provided that $\eta > 0$; and

γ is the apparent rate of shear of the resin (sec^{-1}), provided that $5 \leqq \gamma \leqq 1300$,

Test Conditions:

Temperature: 330° C.

Diameter of Barrel: 9.55 mm

Dimension of Capillary:

Diameter, d=1 mm

Length, l=10 mm

Inlet of Capillary: flat

(b) The resin has a specific surface area of 11 m^2/g or smaller.

6,015,629
STRESS CONTROL FOR TERMINATION OF A HIGH VOLTAGE CABLE

Thomas J. D. Heyer, Austin; Robert A. Wandmacher, Cedar Park; Lawrence C. Chor, and John T. Larson, both of Austin, all of Tex., assignors to 3M Innovative Properties Company, Saint Paul, Minn.

Continuation-in-part of application No. 08/694,344, Aug. 8, 1996, Pat. No. 5,804,630, which is a continuation-in-part of application No. 08/524,390, Sep. 6, 1995, abandoned. This application Sep. 4, 1998, Appl. No. 148,249.

Int. Cl.[7] B32B *15/06;* **H01B** *7/00*

U.S. Cl. 428—625 **8 Claims**

1. An elastically recoverable termination for an electrical power cable including an inner conductor, electrical insulation surrounding the conductor and a semi-conductive shield surrounding the insulation, wherein the shield is removed to a predetermined length and the insulation is removed to a lesser predetermined length to expose the conductor, the termination comprising:

a first region of non-tacky conformable stress control material for contact with a cut end of the cable shield and extending along the cable insulation;

a second region of non-tacky conformable stress control material to be disposed in contact with a cut end of the cable insulation; and

a polymeric electrically insulating layer extending the entire length from a first end of the termination to a second end of the termination, the electrically insulating layer disposed over said first and second regions of stress control material;

wherein the non-tacky stress control material comprises

a) 100 parts of a resin component containing

1) from 20% to 80% of an epihalohydrin polymer, and

2) correspondingly, from 80% to 20% of an insulating silicone polymer having a tan δ of less than one,

b) from 10 to 200 parts of a filler, said filler being nonconductive at room temperature, selected from the group consisting of barium titanate and hydrated aluminum silicate, and

c) from 0 to 30 parts of a plasticizer.

6,015,630
CERAMIC MATERIALS FOR THERMAL BARRIER COATINGS

Nitin P. Padture, Storrs; Maurice Gell, Newington, and Paul G. Klemens, Mansfield, all of Conn., assignors to The University of Connecticut, Storrs, Conn.

Filed Apr. 10, 1997, Appl. No. 835,411

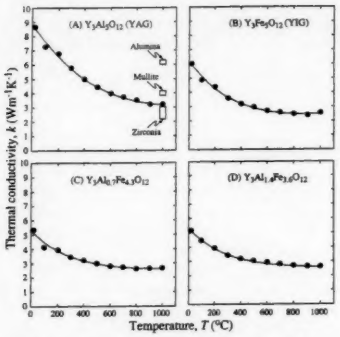
Int. Cl.[7] B32B *15/04*

U.S. Cl. 428—632 **13 Claims**

1. A ceramic-metal composite material suitable for use in a high temperature environment comprising:

a metal substrate having disposed thereon an optional metallic bond coat; and

a YAG-based ceramic thermal barrier coating disposed on the metal substrate or on the optional metallic bond coat, wherein the YAG-based ceramic thermal barrier coating is selected from the group consisting of $Y_3{}^C Al_2{}^A Al_3{}^D O_{12}$, wherein C, A, and D are sites on the crystal structure, and further wherein all or part of the Al^{3+} on the A sites, D sites, or A and D sites are substituted in an amount effective to provide the YAG-based ceramic thermal barrier coating with a thermal conductivity less than or equal to about 3 $Wm^{-1}K^{-1}$ at about 1000° C., an oxygen diffusivity less than or equal to about 10^{-15} m^2s^{-1} at about 1000° C., a thermal coefficient of expansion greater than or equal to about 9×10^{-6}° $C.^{-1}$, a maximum temperature capability greater than or equal to about 1400° C., a hardness



greater than or equal to about 14 GPa, an elastic modulus less than or equal to about 280 GPa, or a density less than or equal to about 6.4 gcm^{-3}.

6,015,631

LUMINESCENT COMPOUND FOR AN ELECTROLUMINESCENCE DISPLAY DEVICE

Jong Wook Park, Kyungki-do, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 6, 1997, Appl. No. 944,320

Claims priority, application Rep. of Korea, Oct. 7, 1996, 96-44370

Int. Cl.[7] B32B *9/00*

U.S. Cl. 428—690 **8 Claims**

1. A luminescent polymer for an electroluminescence display device (ELD) comprising:

a main polymer chain;

a component having an electron-donating group attached to the main polymer chain; and

a component having an electron-accepting group attached to the main polymer chain,

wherein the electron-donating group is an aromatic amine moiety and the electron accepting group is a cyano moiety and the aromatic amine moiety and cyano moiety are conjugated in the main polymer chain of the luminescent polymer.

6,015,632

SELF-ASSEMBLED GIANT MAGNETORESISTANCE LATERAL MULTILAYER FOR A MAGNETORESISTIVE SENSOR

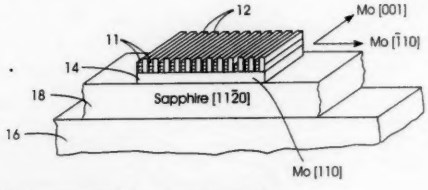
David Darden Chambliss, Katonah, N.Y.; Robin Frederick Charles Farrow, San Jose, Calif.; Ronald Franklin Marks, San Jose, Calif., and Eric Dean Tober, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1997, Appl. No. 947,653

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B32B *15/01;15/04;15/18;* **G11B** *5/39*

U.S. Cl. 428—692 **13 Claims**



1. A magnetoresistive sensor comprising:

a substrate having a substantially planar sensing surface and a substantially planar support surface generally perpendicular to the sensing surface for supporting layers of material in sensor;

a structurally uniaxial crystalline template layer formed on the support surface of the substrate and having a two-fold symmetry axis generally perpendicular to the support surface of the substrate;

a multilayer formed on the uniaxial template layer and comprising alternating layers of a ferromagnetic material and a non-ferromagnetic material selected from the group consisting of Ag, Au and alloys formed of Au and Ag, the composition modulation direction of the alternating layers being substantially parallel to the uniaxial template layer; and

a first electrical lead at one end of the multilayer and a second electrical lead at the other end of the multilayer, whereby electrical current may be passed from the first electrical lead perpendicularly through the alternating layers of the multilayer to the second electrical lead.

6,015,633

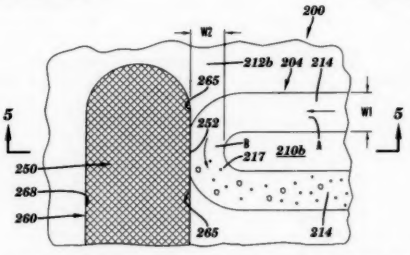
FLUID FLOW PLATE FOR WATER MANAGEMENT, METHOD FOR FABRICATING SAME, AND FUEL CELL EMPLOYING SAME

Charles M. Carlstrom, Jr., Clifton Park, and William P. Acker, Rexford, both of N.Y., assignors to Plug Power, L.L.C., Latham, N.Y.

Filed Oct. 7, 1998, Appl. No. 168,232

Int. Cl.[7] H01M *8/04*

U.S. Cl. 429—13 **38 Claims**



1. A fluid flow plate for a fuel cell, said fluid flow plate comprising:

a porous portion and a non-porous portion together forming on a first surface of said plate, a flow channel having at least one turn for distributing a reactant gas in the fuel cell; and

said porous portion defining an outer lateral portion of said at least one turn of said flow channel for regulating humidity of the reactant gas in said flow channel.

6,015,634

SYSTEM AND METHOD OF WATER MANAGEMENT IN THE OPERATION OF A FUEL CELL

Leonard J. Bonville, Jr., Marlborough, and Deliang Yang, Vernon, both of Conn., assignors to International Fuel Cells, South Windsor, Conn.

Filed May 19, 1998, Appl. No. 81,626

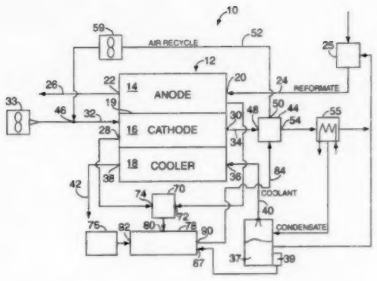
Int. Cl.[7] H01M *8/04*

U.S. Cl. 429—17 **9 Claims**

1. A PEM fuel cell system comprising:

a PEM fuel cell having a coolant input port and coolant output port, a fuel input port and fuel output port, and an air input port and air output port, the air input port to be coupled to a source of fresh air at about ambient temperature;

an adjustable airflow splitter having an input port, first and second output ports, and a control port for adjusting a ratio of volume of air exiting the first output port of the airflow splitter to a volume of air exiting the second output port



(recycle-to-air vent ratio), the input port of the airflow splitter being coupled to the air output port of the PEM fuel cell, the first output port of the splitter communicating with the air input port of the PEM fuel cell;

an ambient temperature measuring device for generating a temperature signal;

an electrical power measuring device coupled to electrodes of the fuel cell for generating a power signal indicative of the percentage of rated power being generated by the fuel cell; and

a processor having inputs coupled to the temperature measuring device, the electrical power measuring device and an output coupled to the control input of the airflow splitter, the processor controlling the airflow splitter for adjusting the recycle-to-air vent ratio of the fuel cell system to a predetermined value to maintain an overall water balance in the fuel cell system at the sensed ambient operating temperature and power level.

6,015,635

ELECTRODE FOR FUEL CELL AND METHOD OF MANUFACTURING ELECTRODE FOR FUEL CELL

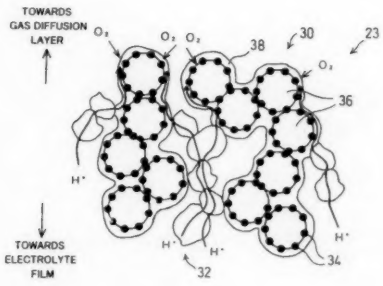
Tatsuya Kawahara, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 22, 1998, Appl. No. 176,971

Claims priority, application Japan, Oct. 23, 1997, 9-309763

Int. Cl.[7] H01M *4/86*

U.S. Cl. 429—42 **18 Claims**



1. An electrode for a fuel cell, comprising:

a plurality of catalyst particles, each catalyst particle comprising a catalyst carried at least on surface thereof and the surface of each catalyst particle being coated with a first electrolyte; and

a plurality of electrolyte clusters, each electrolyte cluster being formed by aggregation of a second electrolyte,

wherein the plurality of catalyst particles are connected with one another via the plurality of electrolyte clusters.

6,015,636

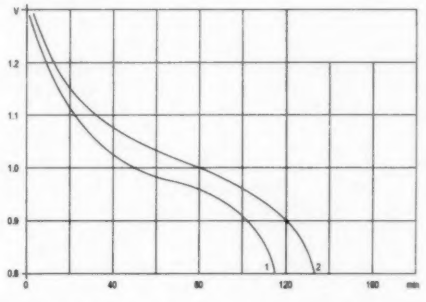
ENHANCED PERFORMANCE ZINC

Jonathan Goldstein, Jerusalem; Menachem Givon, Hanegev, and Yuli Zingerman, Beit Shemesh, all of Israel, assignors to Electric Fuel Ltd., Jerusalem, Israel

Filed Jun. 1, 1998, Appl. No. 88,541

Int. Cl.[7] H01M *4/42*

U.S. Cl. 429—229 **12 Claims**



1. Enhanced performance zinc for use in the negative element of zinc batteries and cells, comprising a mixture of thermally generated zinc particles and particles of electrochemically produced zinc, said particles of electrochemically produced zinc being present in a parts by weight ratio of at least 1:500 relative to said thermally generated zinc.

6,015,637

PROCESS OF PRODUCING LITHIUM NICKEL OXIDE AND NONAQUEOUS SECONDARY BATTERY USING THE SAME

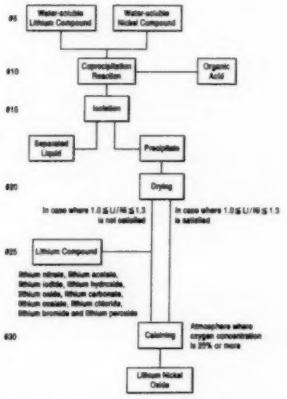
Takehito Mitate, Yamatotakada; Naoto Torata, Kitakatsuragi-gun; Kazuaki Minato, Osaka; Toyoshi Iida, Fukui; Tetsushi Makino, Fukui; Shigeyuki Hamano, Fukui, and Naoyoshi Kameda, Fukui, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, and Tanaka Chemical Corporation, Fukui, both of Japan

Filed Sep. 30, 1997, Appl. No. 941,196

Claims priority, application Japan, Sep. 30, 1996, 8-258106

Int. Cl.[7] H01M *4/52*

U.S. Cl. 429—231.1 **16 Claims**


Water-soluble Lithium Compound
Water-soluble Nickel Compound
Coprecipitation Reaction
Organic Acid
Isolation
Separated Liquid
Precipitate
Drying
In case where 1.0 ≦ Li/Ni ≦ 1.3 is not satisfied
In case where 1.0 ≦ Li/Ni ≦ 1.3 is satisfied
Lithium Compound
Lithium nitrate, lithium acetate, lithium sulfide, lithium hydroxide, lithium oxide, lithium carbonate, lithium oxalate, lithium chloride, lithium bromide and lithium peroxide
Calcining
Atmosphere where oxygen concentration is 25% or more
Lithium Nickel Oxide

1. A process of preparing lithium nickel oxide as a positive electrode active material comprising:

a) dissolving a water-soluble lithium compound and a water-soluble nickel compound in water to form a homogeneous

aqueous solution in which the lithium compound and nickel compound are thoroughy mixed;

b) co-precipitating by addition of an organic acid a lithium salt and a nickel salt in the aqueous solution;

c) isolating the resulting co-precipitate by filtering the co-precipitate from the aqueous solution, and

d) calcining the co-precipitate to obtain lithium, oxide.

6,015,638

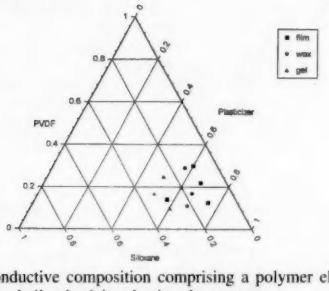
BATTERIES, CONDUCTIVE COMPOSITIONS, AND CONDUCTIVE FILMS CONTAINING ORGANIC LIQUID ELECTROLYTES AND PLASTICIZERS

Susanna C. Ventura, Los Altos; Subhash C. Narang, Redwood City; Georgina Hum; Peikang Liu, both of Menlo Park; Prema Ranganathan, Cupertino, all of Calif., and Luying Sun, Stoughton, Mass., assignors to SRI International, Menlo Park, Calif.

Division of application No. 08/807,215, Feb. 28, 1997, Pat. No. 5,731,104. This application Sep. 8, 1997, Appl. No. 925,456. This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01M *10/40*

U.S. Cl. 429—307 **24 Claims**



1. A conductive composition comprising a polymer electrolyte and a nonvolatile plasticizer having the structure:

R—O—(CO)—O—R_1

wherein:

R and R_1 are independently selected from the group consisting of hydrogen, aryl, alkyl, alkenyl, alkoxy, aralkylene, a halogen, and a haloalkyl, and

R and R_1 are not either CH_2 or CH_3—CH_2— at the same time.

6,015,639

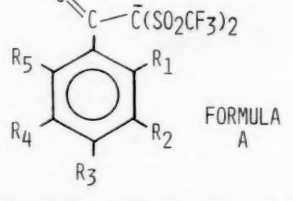
THERMALLY STABLE, HIGHLY CONDUCTIVE SALT

Feng Gao; Jeremy Barker, and Peikang Liu, all of Henderson, Nev., assignors to Valence Technology, Inc., Henderson, Nev.

Filed Jan. 30, 1998, Appl. No. 16,608

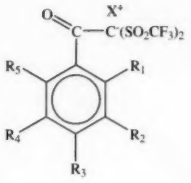
Int. Cl.[7] H01M *6/18*

U.S. Cl. 429—307 **18 Claims**



1. An electrolyte characterized by ion transport capability and comprising a salt represented by the formula:

FORMULA A



where R_1, R_2, R_3, R_4, and R_5 are each identical or different; are each independently selected from hydrogen and an electron withdrawing substituent; provided at least one of said R_1, R_2, R_3, R_4, and R_5 is selected from said electron withdrawing substituent; and where X is an alkali metal selected from the group consisting of lithium, sodium and potassium.

6,015,640

MASK FABRICATION PROCESS

Gregory F. Cardinale, Oakland, Calif., assignor to EUV LLC, Santa Clara, Calif.

Filed Mar. 26, 1998, Appl. No. 48,870

Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—5 **8 Claims**

1. A method for fabricating masks for photolithography, comprising the steps of:

a) patterning an energy sensitive patterning layer disposed on the surface of a structure, wherein the structure includes a substrate, an organic polymeric protective layer, an absorber layer, and an energy sensitive patterning layer;

b) etching the patterning layer and the underlying absorber layer;

c) exposing the patterned and etched surface of the patterning layer and the organic protective layer to UV radiation; and

d) developing the UV exposed surfaces by wet solution developing, thereby removing both the remaining patterning layer as well as that part of the protective layer exposed by etching of the patterning and absorber layers.

6,015,641

REDUCTION OF OPTICAL PROXIMITY EFFECT OF BIT LINE PATTERN IN DRAM DEVICES

Yueh-Lin Chou, Taichung, Taiwan, assignor to Worldwide Semiconductor Manufacturing Corporation, Hsinchu, Taiwan

Filed Jul. 8, 1998, Appl. No. 111,683

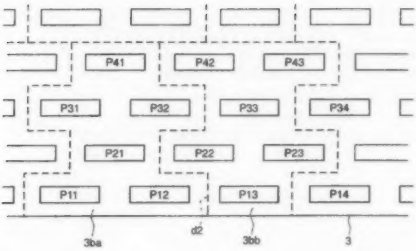
Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—5 **12 Claims**

1. A bitline mask pattern for use in manufacturing a semiconductor memory device comprising:

a plurality of bitlines, each of said bitlines including a plurality of contact pads that are equally spaced apart, said bitlines being arranged parallel to each other in a columnar array and such that alternate bitlines have their contact pads substantially aligned with each other, said contact pads having a rectangular shape, at each corner of said contact pad having rectangular corner portions removed, and with rectangular

side portions removed from opposing sides of said contact pads.



ing at least a portion of two or more of the plurality of pattern elements, said mask comprising

a plurality of regions in which the plurality of blocks are respectively form, wherein:

said blocks are produced by dividing said pattern by parting lines that are plotted in accordance with profiles of said pattern elements.

6,015,642

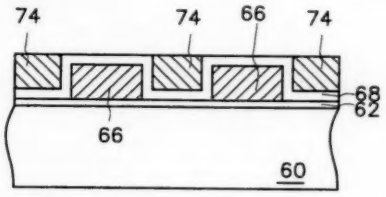
METHOD FOR FORMING A PHOTOMASK

Benjamin Szu-Min Lin, Chiayi, Taiwan, assignor to United Microeletronics Corp., Hsinchu, Taiwan

Filed Nov. 20, 1998, Appl. No. 197,271

Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—5 **11 Claims**



1. A method for forming a photomask, comprising the steps of:

providing a transparent substrate;

forming an anti-reflecting layer on the transparent layer;

forming a first blinding layer on the anti-reflecting layer;

removing a part of the first blinding layer to form first blinding blocks and to expose a part of the anti-reflecting layer;

forming a conformal transparent layer on the first blinding blocks and the exposed anti-reflecting layer;

forming a second blinding layer on the transparent layer; and

removing a part of the second blinding layer to form second blinding blocks between the first blinding blocks and to expose the transparent layer on the position of the first blinding blocks.

6,015,643

MASK USED IN CHARGED PARTICLE BEAM PROJECTING APPARATUS

Mamoru Nakasuji, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Division of application No. 08/720,019, Sep. 27, 1996. This application May 26, 1999, Appl. No. 318,727.

Claims priority, application Japan, Sep. 29, 1995, 7-253907

Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—5 **5 Claims**

1. A mask used in a charged particle beam projecting apparatus for projecting a pattern onto a portion of a substrate corresponding to a single chip, the pattern including a plurality of pattern elements corresponding to features of the single chip, the pattern being divided into a plurality of blocks, each of the blocks includ-

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6,015,644

PROCESS FOR DEVICE FABRICATION USING A VARIABLE TRANSMISSION APERTURE

Raymond Andrew Cirelli, Hillsborough; Masis Mkrtchyan, Stirling, both of N.J.; Lee Edward Trimble, Orlando, Fla.; George Patrick Watson, Avon, and David Lee Windt, Berkeley Heights, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Provisional application No. 60/075,293, Feb. 20, 1998. This application Nov. 12, 1998, Appl. No. 190,351.

Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—30 **11 Claims**

1. A process for device fabrication comprising:

projecting radiation from a radiation source through a filter element with a plurality of apertures therein wherein at least one of the apertures is a partially transmissive aperture that has a transmittance in the range from greater than zero to less than 100 percent;

directing the radiation transmitted through the filter element onto a patterned mask through which is transmitted patterned radiation;

directing the patterned radiation onto a layer of energy sensitive material, thereby transferring an image of the mask into the energy sensitive material; and

developing a pattern from the image wherein the apertures in the filter element have a size and transmittance selected by:

determining an intensity profile for the patterned radiation based upon the pattern;

modeling the intensity of light transmitted through each aperture in the filter element individually;

combining the intensity profiles and comparing the combined intensity profile with the intensity profile for the patterned radiation; and selecting aperture size and transmittance based upon the comparison.

6,015,645

PHOTOCONDUCTIVE IMAGING MEMBERS

Dasarao K. Murti, Mississauga, and Daniel A. Foucher, Toronto, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 29, 1998, Appl. No. 86,743

Int. Cl.[7] G03G *5/10*

U.S. Cl. 430—59 **38 Claims**

1. A photoconductive imaging member comprised of a supporting substrate, a hole blocking layer, an optional adhesive layer, a photogenerator layer, and a charge transport layer, and wherein said blocking layer is comprised of a polyhaloalkylstyrene.

6,015,646

ELECTROPHOTOSENSITIVE MATERIAL AND IMAGE FORMING METHOD USING THE SAME

Hiroaki Iwasaki; Yukimasa Watanabe; Sakae Saitoh; Shyunichi Matsumoto, and Maki Uchida, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Dec. 14, 1998, Appl. No. 210,612

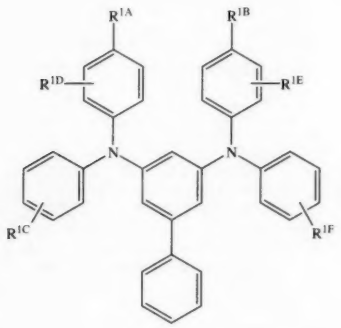
Claims priority, application Japan, Dec. 25, 1997, 9-358633

Int. Cl.[7] G03G *5/09*

U.S. Cl. 430—83 **10 Claims**

1. An electrophotosensitive material comprising a single-layer photosensitive layer containing a charge generating material and a m-phenylenediamine compound represented by the general formula (1):

(1)



wherein R^{1A} and R^{1B} are the same or different and indicate an alkyl group; and R^{1C}, R^{1D}, R^{1E} and R^{1F} are the same or different and indicate a hydrogen atom or an alkyl group.

6,015,647

TONER FOR DEVELOPING ELECTROSTATIC IMAGE AND IMAGE FORMING METHOD

Toshiyuki Ugai, Toride, and Manabu Ohno, Numazu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1999, Appl. No. 289,944

Claims priority, application Japan, Apr. 14, 1998, 10-103166

Int. Cl.[7] G03G *9/097;13/22*

U.S. Cl. 430—110 **38 Claims**

1. A toner for developing an electrostatic image, comprising toner particles containing at least a binder resin, a colorant and a wax composition; wherein

the wax composition comprises an ester wax (**1**) having a long-chain alkyl group, and a wax (**2**); said wax (**2**) showing a maximum heat-absorption peak in a range of 40–130° C. on temperature increase on a DSC (differential scanning calorimeter) curve, and giving a ^{13}C-NMR (nuclear magnetic resonance) spectrum showing a total peak area S in a range of 0–50 ppm, a total peak area **S1** in a range of 36–42 ppm, and a total peak area **S2** in a range of 10–17 ppm, satisfying:

$1.0 \leqq (S1/S) \times 100 \leqq 10$,

$1.5 \leqq (S2/S) \times 100 \leqq 15$, and

$S_1 < S_2$, and

the toner particles contain A wt. parts of the ester wax (**1**), B wt. parts of the wax (**2**) and C wt. parts of the colorant, respectively per 100 wt. parts of the binder resin, satisfying:

$3 \leqq A \leqq 30$,

$0.2 \leqq B \leqq 10$,

$4 \leqq A+B \leqq 40$,

$0.02 \leqq B/A \leqq 0.5$, and

$0.02 \leqq B/C \leqq 2$.

6,015,648

GAS STREAM CLASSIFIER AND PROCESS FOR PRODUCING TONER

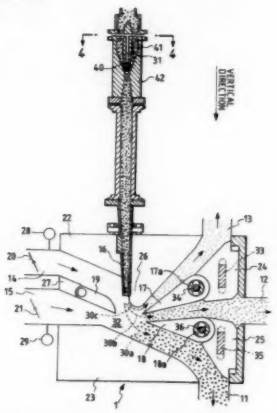
Satoshi Mitsumura, Yokohama; Toshinobu Ohnishi, Urawa, and Yoshinori Tsuji, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of application No. 08/685,963, Jul. 22, 1996. This application Feb. 18, 1999, Appl. No. 252,078.

Claims priority, application Japan, Jul. 25, 1995, 7-189156; Jul. 25, 1995, 7-189160; Jul. 25, 1995, 7-208489; Jul. 25, 1995, 7-208490

Int. Cl.[7] G03G *5/00*

U.S. Cl. 430—137 **10 Claims**



1. A process for producing a toner, comprising:

classifying colored resin particles containing at least a binder resin and a colorant, by means of a gas stream classifier utilizing Coanda effect; and

producing the toner from a powder fraction thus classified; wherein;

said gas stream classifier comprises a gas stream classifying means for classifying colored resin particles supplied from a feed supply nozzle, into at least a coarse powder fraction, a median powder fraction and a fine powder fraction by an inertia force acting on particles and a centrifugal force acting on a curved gas stream due to Coanda effect in a classification zone;

said classification zone being defined by at least a Coanda block and a plurality of classifying edges; said feed supply nozzle being provided at the top of the gas stream classifier; the Coanda block being provided on one side of said feed supply nozzle; and said feed supply nozzle having at its rear end a feed powder intake portion for supplying the colored resin particles, and a high-pressure air intake portion.

6,015,649

METHOD OF MANUFACTURING SUPPORT FOR PLANOGRAPHIC PRINTING PLATE

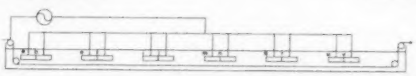
Takahiro Mori, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jun. 10, 1997, Appl. No. 872,773

Claims priority, application Japan, Jun. 12, 1996, 8-151036

Int. Cl.[7] G03C *1/52;* **C25F** *1/02*

U.S. Cl. 430—193 **11 Claims**



1. A method of manufacturing a support of a presensitized planographic printing plate having a light-sensitive layer, the method comprising the step of:

electrolytically surface-roughening an aluminum plate or an aluminum alloy plate in an acidic electrolyte solution in which an electrode is placed, the surface-roughening step comprising a first step and a second step carried out alternately, the electrode being positioned to face the plate in the first step and the electrode being positioned not facing the plate in the second step; and

subjecting the surface-roughened plate to an anodizing treatment,

wherein an average quantity of electricity of 100 C/dm^2 or less is supplied at the first step.

6,015,650

METHOD FOR FORMING MICRO PATTERNS OF SEMICONDUCTOR DEVICES

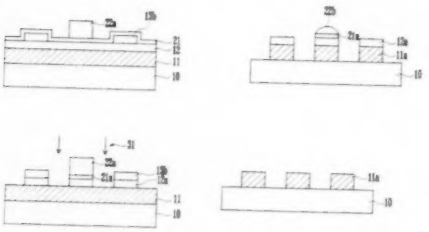
Sang Man Bae, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Dec. 27, 1996, Appl. No. 777,202

Claims priority, application Rep. of Korea, Dec. 29, 1995, 95-66023

Int. Cl.[7] **G03F** *7/00*

U.S. Cl. 430—314 **6 Claims**



1. A method for forming a micro pattern of a semiconductor device, the method comprising:

providing a semiconductor substrate;

forming a lower layer on the substrate;

forming a first photoresist film on the lower layer;

selectively exposing the first photoresist film to light using a first light exposure mask that includes a first transparent substrate and a first light shield film pattern;

developing and etching a portion of the first photoresist film exposed by the light to form a first photoresist film pattern;

heating the first photoresist film pattern;

forming an intermediate layer on exposed portions of the lower layer and the first photoresist film pattern after the heating step, wherein the intermediate layer includes a plasma-enhanced oxide film, WSi film or TiN film, to stably keep a subsequently-formed second photoresist film without involving a variation in pattern width upon etching the lower layer;

forming the second photoresist film on the intermediate layer;

selectively exposing the second photoresist film to light using a second light exposure mask that includes a second transparent substrate and a second light shield film pattern;

developing and etching a portion of the second photoresist film exposed by the light to form a second photoresist film pattern having pattern portions that are each disposed between adjacent pattern portions of the first photoresist film pattern so that the respective pattern portions of the first and second photoresist film patterns are interlaced;

selectively removing exposed portions of the intermediate layer using the second photoresist film pattern as a mask;

selectively removing the lower layer using the first and second photoresist film patterns as a mask to form a lower layer pattern; and

removing the first and second photoresist film patterns and the intermediate layer pattern left on the lower layer pattern.

6,015,651

SOLDER RESIST INK COMPOSITION OF A NOVOLAK-EPOXY RESIN

Toshio Awaji, Kawanishi; Nobuaki Otsuki, Suita; Motohiro Arakawa, Mino, and Hiromichi Tanaka, Takatsuki, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Continuation of application No. 08/412,219, Mar. 27, 1995, which is a division of application No. 08/118,319, Sep. 9, 1993. This application Apr. 28, 1997, Appl. No. 846,167.

Claims priority, application Japan, Sep. 10, 1992, 4-242000; Jul. 16, 1993, 5-176787

Int. Cl.[7] **G03C** *5/16;1/74;* **C08F** *2/50*

U.S. Cl. 430—315 **16 Claims**

1. A method of forming a resist pattern comprising, in the following order:

a) providing a method comprising a photo-polyinerizable resin (A), a photo-polymerization initiator (B) and a diluent (C), wherein the photo-polymerizable resin (A) is prepared by:

reacting a novolak-epoxy resin (I) with (meth)acrylic acid (II) to introduce (meth)acryloyl groups into the epoxy resin (I) by the reaction between carboxyl group in (meth)acrylic acid (II) and epoxy group in the epoxy resin (I); and combining two or more resulting products to increase the molecular weight of said photo-polymerizable resin (A) by reacting two or more functional groups in a chain-extenision agent (III) reactable with the epoxy groups remaining in the resulting products,

said chain-extension agent (III) being selected from the group consisting of polyhydric phenols having two or more phenol groups, polybasic acids having two or more carboxyl groups, and polyhydric thiols having two or more thiol groups; and wherein the reaction between said chain-extension agent (III) and the epoxy group remaining in the resulting products is carried out at 80 to 130° C. in the presence or absence of diluent (C) and in the co-presence of a polymerization inhibitor and a reaction catalyst;

b) applying said solder resist in composition on a printed circuit board;

c) heat-drying said solder resist ink composition and forming a tack-free photoresist layer on the board;

d) laminating a photomask onto said photoresist layer;

e) exposing said photoresist layer through said photomask to cure an exposed portion thereof; and

f) peeling off the photomask and developing the photoresist layer by removing a non-exposed portion thereof.

6,015,652

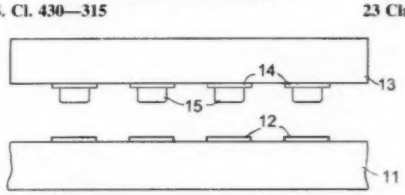
MANUFACTURE OF FLIP-CHIP DEVICE

Louis Nelson Ahlquist, Annandale, and Yinon Degani, Highland Park, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 27, 1998, Appl. No. 32,338

Int. Cl.[7] **G03C** *5/00*

U.S. Cl. 430—315 **23 Claims**



1. A process for the manufacture of semiconductor devices in which a metal layer on a substrate is patterned by the steps of:

(a) applying a layer of photoresist on said substrate,

(b) patterning said layer of photoresist to form windows in said layer of photoresist,

(c) exposing said patterned layer of photoresist to a flux of UV radiation to form a hardened patterned layer of photoresist,

(d) depositing a metallization layer over said hardened patterned layer of photoresist and over said windows, and

(e) removing said hardened patterned layer of photoresist from said substrate thereby patterning said metallization layer by lift-off, leaving those portions of said metallization in said windows remaining.

6,015,653

METHOD FOR PROCESSING TRANSPARENT SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND PRODUCT THEREBY

Manabu Nakahanada, and Wataru Satake, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

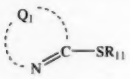
Filed Apr. 26, 1999, Appl. No. 299,464

Claims priority, application Japan, May 1, 1998, 10-137555; Jun. 2, 1998, 10-152853

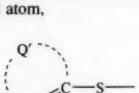
Int. Cl.[7] **G03C** *7/30*

U.S. Cl. 430—393 **10 Claims**

1. A method for processing a transparent silver halide color photographic material comprises the step of treating the transparent silver halide photographic light-sensitive material with a processing solution containing a compound represented by Formula (I), wherein after the treating, a ratio (E/G) of a light absorbance E of unexposed area of the light-sensitive material at 650 nm to an amount of silver G mg/m^2 remaining in the light-sensitive material is within the range of from 3.0×10^{-4} to 1.5×10^{-3} in the silver halide photogrpahic light-sensitive material,



wherein Q is a group of atoms necessary for forming a nitrogen-containing heterocyclic ring (including one condensed with a 5- or 6-member unsaturated ring), R_{11} is a hydrogen atom, an alkali metal atom,



or an alkyl group, Q' is a synonym for Q_1.

6,015,654

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Jörg Hagemann, Köln, and Siegfried Dzwonnek, Pulheim, both of Germany, assignors to AGFA-Gevaert NV, Mortsel, Belgium

Filed Feb. 9, 1998, Appl. No. 20,610

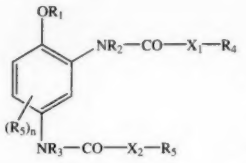
Claims priority, application Germany, Feb. 18, 1997, 197 06 237

Int. Cl.[7] **G03C** *7/333*

U.S. Cl. 430—504 **11 Claims**

1. A color photographic recording material which comprises on a support, at least one blue-sensitive silver halide emulsion layer with which a yellow coupler is associated, at least one green-sensitive silver halide emulsion layer with which a magenta coupler is associated, and at least one red-sensitive silver halide emulsion layer with which a cyan coupler is associated, light-insensitive intermediate layers between the layers of different color-sensitivity, wherein at least one of said magenta coupler in at least one green-sensitive silver halide emulsion layer is a pyrazolotriazole coupler and at least one of said layers contains a developer oxidation product ("DOP") scavenger, a compound of formula I

(I)



wherein

X_1 and X_2 are identical or different and are a single bond, —O— or —NR_7—,

R_1 is hydrogen or a group which can split off under the conditions of chromogenic development,

R_2 is hydrogen or —CO—X_1—R_4,

R_3 is hydrogen or —CO—X_2—R_5,

R_4 and R_5 are identical or different and are hydrogen, alkyl, alkenyl or a heterocyclic group,

R_6 is alkyl, aryl, acyl, alkoxy, aryloxy, acyloxy, halogen, —OH, —COOM, —SO_3M, —CN or —NO_2,

R_7 is hydrogen, alkyl, aryl or acyl,

M is hydrogen or a cation, and

n is 0, 1, 2 or 3

and wherein at least one R_2 or R_3 substituent is hydrogen.

6,015,655

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Jörg Hagemann, and Werner Hoheisel, both of Köln, Germany, assignors to Agfa-Gevaert NV, Mortsel, Belgium

Filed Jul. 14, 1999, Appl. No. 350,344

Claims priority, application Germany, Jul. 22, 1998, 198 32 937

Int. Cl.[7] **G03C** *1/815*

U.S. Cl. 430—512 **14 Claims**

1. A color photographic recording material comprising at least one light sensitive silver halide emulsion layer and optionally a light insensitive layer which is disposed nearer the source of light than is the light sensitive silver halide emulsion layer, and at least one of said layers contains particles of cerium(IV) oxide, zinc oxide or barium titanate with an average diameter <300 nm.

6,015,656

TABULAR SILICA DISPERSION AND SILVER HALIDE PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Ken Nagami, Hino, Japan, assignor to Konica Corporation, Japan

Filed Jul. 16, 1999, Appl. No. 356,777

Claims priority, application Japan, Jul. 21, 1998, 10-204990

Int. Cl.[7] **G03C** *1/76;1/30;1/04;1/047;* **C08L** *89/00*

U.S. Cl. 430—531 **15 Claims**

1. A tabular silica dispersion obtained by mixing a tabular silica, gelatin, a cyclodextrin and a compound capable of crosslinking gelatin.

15. A silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer and a light-insensitive hydrophilic colloidal layer, wherein said photographic material is obtained by coating a coating composition obtained by incorporating a tabular silica dispersion as claimed in claim **1** into a composition constituting the silver halide emulsion layer or light-insensitive hydrophilic colloidal layer.

6,015,657

PHOTOGRAPHIC ELEMENTS CONTAINING 2-EQUIVALENT PYRAZOLONE COUPLERS AND PROCESS FOR THEIR USE

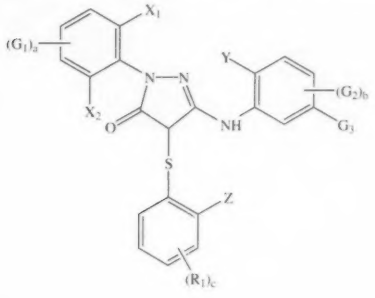
Sundram Krishnamurthy, Penfield, N.Y.; Michael William Crawley, Herts, United Kingdom; David Scott Bailey, and John Lawrence Pawlak, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application No. 07/905,052, Jun. 26, 1992, abandoned, which is a continuation-in-part of application No. 07/731,671, Jul. 17, 1991, abandoned. This application Jan. 10, 1994, Appl. No. 179,473.

Int. Cl.[7] G03C *1/73*

U.S. Cl. 430—554 **19 Claims**

1. A photographic element comprising at least one photosensitive silver halide emulsion layer having associated therewith a 5-pyrazolone photographic coupler represented by the formula:



wherein:

a) substituents X_1, X_2, Y, G_1, and G_2 are individually selected from the group consisting of halogen, alkyl, alkoxy, aryloxy, acylamino, alkylthio, arylthio, sulfonamido, sulfamoyl, sulfamido, carbamoyl, diacylamino, alkoxycarbonyl, aryloxycarbonyl, alkoxysulfonyl, aryloxysulfonyl, alkylsulfonyl, arylsulfonyl, alkylsulfinyl, arylsulfinyl, alkoxycarbonylamino, aryloxycarbonylamino, alkylureido, arylureido, acyloxy, nitro, trifluoromethyl and carboxy and, in the case of X_1, X_2, and Y, hydrogen;

b) a, b, and c are individually integers form 0 to 3 provided that "a" cannot be an integer which, combined with the selection of X_1 and X_2, allows the number of chloride substituents on the ring containing G_1 to exceed 3;

c) G_3 is selected from the group consisting of hydrogen, halogen, acylamino, sulfonamido, sulfamido, carbamoyl, diacylamino, alkoxycarbonyl, aryloxycarbonyl, alkoxysulfonyl, aryloxysulfonyl, alkylsulfonyl, arylsulfonyl, alkylsulfinyl, arylsulfinyl, alkoxycarbonylamino, aryloxycarbonylamino, alkylureido, arylureido, acyloxy, trifluoromethyl and carboxyl;

d) R_1 is selected from the group consisting of G_1 and hydroxyl;

e) Z is an alkyl group containing at least 3 carbon atoms; and

f) the sum of the Hammett's sigma values for X_1, X_2, Y, G_1, G_2, and G_3 is at least 1.3.

6,015,658

PHOTOGRAPHIC ELEMENT COMPRISING YELLOW DYE-FORMING PHOTOGRAPHIC COUPLER

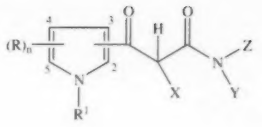
Thomas R. Welter, Webster, and James H. Reynolds, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1998, Appl. No. 69,654

Int. Cl.[7] G03C *1/08;7/26;7/32*

U.S. Cl. 430—557 **22 Claims**

1. A photographic element comprising a silver halide emulsion layer having associated therewith a dye-forming coupler having Formula I



wherein:

X is hydrogen or a coupling-off group;

Y and Z are each independently selected hydrogen or a substituent;

R^1 is a substituent; and

each R is an independently selected substituent located at any position other than the acylacetamido position, and n is 2 or 3; provided that substituents may join to form a ring.

6,015,659

INDUCEMENT OF THERMOTOLERANCE WITH BENZOQUINONOID ANSAMYCINS

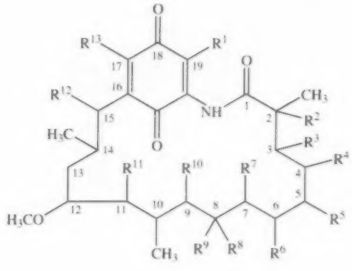
William J. Welch, and Ramanujan Hegde, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of application No. 08/432,842, May 2, 1995, abandoned. This application Sep. 16, 1997, Appl. No. 931,772.

Int. Cl.[7] A01N *55/02;1/02*

U.S. Cl. 435—1.2 **24 Claims**

1. A method for converting living biological matter selected from mammals and mammalian organs to a thermotolerant phenotype, said method comprising treating said living biological matter with a compound having the following formula, with ring vertices as shown:



in which:

R^1 is a member selected from the group consisting of H, halogen, OH, and OCH_3;

R^2 and R^3 are either both H or together form a double bond between ring vertices 2 and 3;

R^4 and R^5 are either both H or together form a double bond between ring vertices 4 and 5;

R^6 is a member selected from the group consisting of H, halogen, OH, CH_3, and OCH_3;

R^7 either is NH_2COO or is combined with R^{10} to form NHCOO bridging ring vertices 7 and 9;

R^8 is a member selected from the group consisting of H and CH_3;

R^9 either is OH or is combined with R^{10} to form either (a) a double bond between ring vertices 8 and 9 or (c) a single oxy oxygen (—O—) bridging ring vertices 8 and 9;

R^{10} is combined with either R^7 or R^9 in accordance with the definitions of R^7 and R^9;

R^{11} is a member selected from the group consisting of H, OH, OCH_3 and CH_3;

R^{12} is a member selected from the group consisting of H OH, OCH_3 and CH_3; and

R^{13} is a member selected from the group consisting of H, halogen, OH, and OCH_3;

at a dosage of about 50 to about 200 mg/kg.

6,015,660

BORNA DISEASE VIRAL SEQUENCES, DIAGNOSTICS AND THERAPEUTICS FOR NERVOUS SYSTEM DISEASES

W. Ian Lipkin; Thomas Briese, both of Laguna Beach; Stefanie Kliche; Patrick A. Schneider, both of Irvine, all of Calif.; Lothar Stitz, Wetzlar, Germany, and Anette Schneemann, Santa Ana, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jan. 6, 1995, Appl. No. 369,822

Int. Cl.[7] **C12Q** *1/70;* **G01N** *33/543;33/569*

U.S. Cl. 435—5 **18 Claims**

1. A method of detecting, in a sample, a ligand capable of binding a BDV protein, said method comprising the steps of:

a) contacting the sample with at least one isolated protein selected from the group consisting of: p23, recp23, and a protein comprising an amino acid sequence as set forth in SEQ ID NO:4, wherein said isolated protein is prebound to a solid support without gel size fractionation; and

b) determining whether a ligand binds to the protein.

6,015,661

METHODS FOR THE DETECTION OF NON-PATHOGENIC HIV-1 STRAINS CONTAINING DELETIONS IN THE NEF CODING REGION AND U3 REGION OF THE LTR

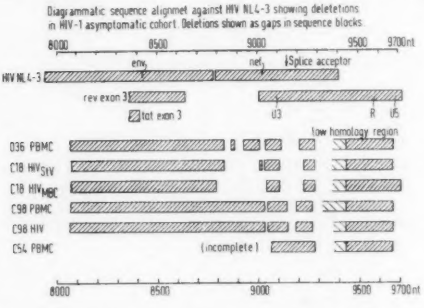
Nicholas John Deacon, Balwyn; Dale Alan McPhee, Fitzroy, and Suzanne Crowe, South Yarra, all of Australia, assignors to The Macfarlane Burnet Centre for Medical Research Limited, Fairfield, Australia

Continuation-in-part of application No. 08/388,353, Feb. 14, 1995. This application Jun. 7, 1995, Appl. No. 488,551.

Claims priority, application Australia, May 17, 1995, PN3021/95

Int. Cl.[7] **C12Q** *1/70;1/68;* **G01N** *33/53*

U.S. Cl. 435—5 **5 Claims**



1. A method for detecting a non-pathogenic HIV-1 strain in the body fluids of an HIV infected individual comprising:

(a) obtaining and preparing a biological sample from said HIV infected individual;

(b) admixing an aliquot of said sample with an HIV-1_{NL43} Nef peptide consisting of amino acids 166–206;

(c) admixing an aliquot of said sample with an HIV-1_{NL43} Nef peptide wherein said peptide contains a known HIV-1 antigenic determinant but excludes amino acids 166–206 of Nef;

(d) detecting the formation of antigen/antibody complexes of the samples of steps (a) and (b);

wherein the absence of immune complex formation in step (b) and the presence of immune complex formation in step (c) is indicative of said individual being infected with a non-pathogenic HIV-1 strain.

6,015,662

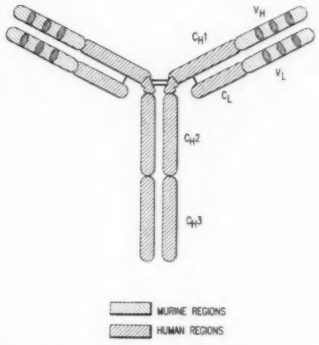
REAGENTS FOR USE AS CALIBRATORS AND CONTROLS

John R. Hackett, Jr., Gurnee; Jane A. Hoff, Naperville; David H. Ostrow, Lake Zurich, and Alan M. Golden, Wilmette, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 23, 1996, Appl. No. 589,939

Int. Cl.[7] **G01N** *33/569;33/577*

U.S. Cl. 435—5 **55 Claims**



1. A method for detecting the presence of antibody which may be present in a test sample wherein said method comprises (A) contacting said test sample suspected of containing said antibody with antigen specific for said antibody for a time and under conditions sufficient to allow the formation of antigen/antibody complexes, (B) detecting the presence of said antibody which may be present in said test sample and employing, as a control or calibrator, a reagent which binds to said antigen, wherein the improvement comprises employing, as said control or calibrator, a chimeric antibody comprising murine heavy and light chain variable regions genetically fused to human or a species immunologically cross0reactive with human heavy and light chain constant regions, wherein said chimeric antibody binds to said antigen and is homogeneous with respect to specificity and affinity.

6,015,663

RESTRICTION ENZYME SCREEN FOR DIFFERENTIATING PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS STRAINS

Ronald D. Wesley; Deborah F. Clouser; William L. Mengeling, all of Ames, Iowa; Vladimir G. Andreyev, Vladimir, Russian Federation; Ann C. Vorwald, Ames, and Kelly M. Lager, Nevada, both of Iowa, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 1, 1996, Appl. No. 609,334

Int. Cl.[7] **C12Q** *1/70;1/68*

U.S. Cl. 435—5 **9 Claims**

1. A method for differentiating any one of a first North American strain of Porcine ReproductiVe and Respiratory Syndrome Virus (PRRSV) from any one of a second North American strain of said virus wherein said first and second North American strains are selected from the pool of all known North American strains of PRRSV comprising the steps:

a. reverse transcribing and amplifying the ORP 5 region of said first strain to produce an amplified cDNA of said region;

b. selecting from a matrix of ORF-5 restriction enzyme patterns for said known North American strains of PRRSV at least one restriction enzyme which yields a distinctive fragment profile from said cDNA as compared to a fragment profile of a corresponding cDNA from said second strain;

c. cleaving the ORF 5 cDNA of said first strain with said at least one restriction enzyme;

d. comparing the restriction enzyme fragment pattern resulting from step (c) with the restriction enzyme fragment pattern produced by digesting the cDNA from said second strain with the same enzyme used in step (c); and

e. differentiating said first North American strain of PRRSV from said second North American strain of PRRSV based on the comparing in step (d).

6,015,664

MULTIPLEX PCR ASSAY USING UNEQUAL PRIMER CONCENTRATIONS TO DETECT HPIV 1,2,3 AND RSV A,B AND INFLUENZA VIRUS A, B

Kelly J. Henrickson, Oconomowoc, and Jiang Fan, Wauwatosa, both of Wis., assignors to MCW Research Foundation, Milwaukee, Wis.

Continuation-in-part of application No. 08/552,907, Nov. 3, 1995, Pat. No. 5,744,299. This application Aug. 1, 1996, Appl. No. 691,045.

Int. Cl.[7] **C12Q** *1/68;1/70;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—5 **1 Claim**

1. A method of detecting multiple virus infection in a biological sample comprising the steps of

(a) isolating nucleic acid from a biological sample,

(b) exposing the nucleic acid or cDNA created from the nucleic acid to primer pairs specific for human parainfluenza virus-1, 2 and 3, respiratory syncytial virus A and B and influenza virus A and B sequences under conditions suitable for nucleic acid amplification, wherein the primers selectively amplify the virus sequence and not other sequences, wherein an amplification product is formed if the sample contains any of the viruses and wherein the amplification comprises the improvement of supplying 5' and 3' primers of unequal concentrations wherein the product is double-stranded PCR products, and

(c) determining whether the amplification product is present by exposing the step (b) products to protein-linked oligonucleotide probes, wherein the protein is capable of binding to a solid support, under conditions suitable for hybridization between complementary nucleic acid sequences, binding the oligonucleotide to the solid support, and examining the probes for the presence of a hybridization product, wherein the oligonucleotide probes are of a sequence identical to a viral sequence.

6,015,665

METHOD AND COMPOSITION FOR REGULATING APOPTOSIS

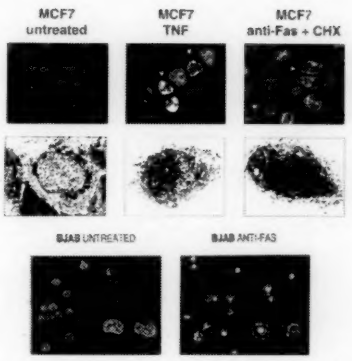
Vishva M. Dixit, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Feb. 13, 1995, Appl. No. 389,812

Int. Cl.[7] **C12Q** *1/68;* **C12N** *3/00;* **A01N** *43/04*

U.S. Cl. 435—6 **11 Claims**

1. A method for preventing or inhibiting apoptosis, in a mammalian cell, wherein the cell is induced to apoptosis by the binding of a ligand to its cell surface receptor, comprising introducing into the mammalian cell an effective amount of a nucleic acid molecule



coding for a gene product having crmA biological activity and under conditions such that apoptosis is prevented or inhibited.

6,015,666

RAPID DNA TEST FOR DETECTING QUINOLONE-RESISTANT *STAPHYLOCOCCUS AUREUS* PATHOGENS IN CLINICAL MATERIAL

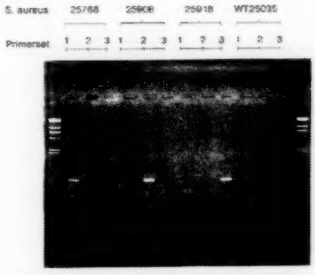
Wolfgang Springer, Wuppertal; Klaus-Dieter Bremm, Recklinghausen, and Rainer Endermann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 7, 1995, Appl. No. 477,010

Claims priority, application Germany, Jun. 23, 1994, 44 21 901

Int. Cl.[7] **C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **5 Claims**



1. A method for detecting quinolone-resistant *Staphylococcus aureus* organisms in a sample material, said method comprising the following steps:

a) amplifying quinolone-resistant *Staphylococcus aureus* DNA or RNA in said sample material using amplification primers consisting of optionally labeled SEQ ID NOS.: 1–4 to yield amplified quinolone-resistant *Staphylococcus aureus* DNA or RNA by a method consisting essentially of:

i) dividing the sample material into at least three portions;

ii) incorporating a first primer set consisting of optionally labeled SEQ ID NO.: 1 and optionally labeled SEQ ID NO.: 4 into a first portion of said sample material, and thereafter conducting an amplification reaction on said first portion of said sample material;

iii) incorporating a second primer set consisting of optionally labeled SEQ ID NO.: 2 and optionally labeled SEQ ID NO.: 4 into a second portion of said sample material, and thereafter conducting an amplification reaction on said second portion of said sample material; and

iv) incorporating a third primer set consisting of optionally labeled SEQ ID NO.: 3 and optionally labeled SEQ ID NO.: 4 into a third portion of said sample material, and

thereafter conducting an amplification reaction on said third portion of said sample material; and

b) determining the presence of amplified quinolone-resistant *Staphylococcus aureus* DNA or RNA resulting from step a) to give an indication of the presence of quinolone-resistant *Staphylococcus aureus* organisms in said sample material by a method comprising:

i) detecting the amplified quinolone-resistant *Staphylococcus aureus* DNA or RNA directly, wherein the presence of the amplified quinolone-resistant *Staphylococcus aureus* DNA or RNA indicates that the sample material contains quinolone-resistant *Staphylococcus aureus* organisms; or

ii) hybridizing the amplified quinolone-resistant *Staphylococcus aureus* DNA or RNA with an oligonucleotide probe consisting of labeled SEQ ID NO.: 5, or with a polynucleotide probe consisting of labeled SEQ ID NO.: 6, under conditions suitable to form a hybridization product of said oligonucleotide probe or said polynucleotide probe and said amplified quinolone-resistant *Staphylococcus aureus* DNA or RNA, and thereafter detecting the presence of the hybridization product by detecting the label, wherein the detection of the hybridization product indicates that the sample material contains quinolone-resistant *Staphylococcus aureus* organisms.

6,015,667

MULTICOMPONENT ANALYSIS METHOD INCLUDING THE DETERMINATION OF A STATISTICAL CONFIDENCE INTERVAL

Muhammad A. Sharaf, Oakland, Calif., assignor to The Perkin-Emer Corporation, Foster City, Calif.

Filed Jun. 3, 1996, Appl. No. 659,115

Int. Cl.[7] C12Q *1/68;* C12P *19/34*

U.S. Cl. 435—6 **13 Claims**

1. A signal processing method in a processor for performing a multicomponent analysis of a signal resulting from a spectral response of a mixture comprising a plurality of spectrally resolvable molecular species, including the determination of a concentration estimate and a statistical confidence interval for each species, such method comprising the steps of:

receiving a data vector d from a multichannel detector, data vector d having length n_c, n_c being the number of detector channels being monitored, the magnitude of each vector element d_i representing a signal intensity at a particular channel i;

providing a calibration matrix K having n_c rows and n_p columns wherein n_c is larger than n_p, n_p being the number of spectrally resolvable molecular species, the magnitude of each matrix element K_{ij} representing a calibration value at a particular channel i for a particular species j;

determining a concentration estimate vector c having length n_p, the magnitude of each vector element c_i representing a concentration estimate of a particular species i;

determining a confidence interval Ci_i for each of the elements of the concentration estimate vector according to the expression

$$CI_i = c_i \pm (\text{varcovar}(c_{ii}))^{1/2} Q_{(cl,nf)}$$

where Q is a critical value of a statistical distribution for a given level of confidence, cl, and a given number of degrees of freedom n_f, where $n_f = n_c - n_p$.

6,015,668

CLONED DNA POLYMERASES FROM THERMOTOGA AND MUTANTS THEREOF

A. John Hughes, Germantown, and Deb K. Chatterjee, Gaithersburg, both of Md., assignors to Life Technologies, Inc., Rockville, Mass.

Continuation-in-part of application No. 08/689,818, Aug. 14, 1996, abandoned, and application No. 08/576,759, Dec. 21, 1995, which is a continuation of application No. 08/537,397, Oct. 2, 1995, abandoned, which is a continuation-in-part of application No. 08/525,057, Sep. 8, 1995, abandoned, said application No. 08/689,818 is a continuation-in-part of application No. 08/537,400, Oct. 2, 1995, which is a continuation-in-part of application No. 08/370,190, Jan. 9, 1995, which is a continuation-in-part of application No. 08/316,423, Sep. 30, 1994, abandoned. This application Sep. 6, 1996, Appl. No. 706,706.

Int. Cl.[7] C12Q *1/68;* C12P *19/34;* C12N *9/12*

U.S. Cl. 435—6 **55 Claims**

1. A method of sequencing a DNA molecule comprising:

(a) hybridizing a primer to a first DNA molecule;

(b) contacting said first DNA molecule with deoxyribonucleoside triphosphates, a *Thermotoga neapolitana* DNA polymerase, and a terminator molecule to form a mixture;

(c) incubating said mixture under conditions sufficient to synthesize a random population of DNA molecules complementary to said first DNA molecule and wherein said synthesized DNA molecules comprise a terminator nucleotide at their 5' termini; and

(d) separating said synthesized DNA molecules by size so that at least a portion of the nucleotide sequence of said first DNA molecule can be determined; wherein:

said *Thermotoga neapolitana* DNA polymerase is selected from the group consisting of a mutant *Thermotoga neapolitana* DNA polymerase and a fragment of said mutant *Thermotoga neapolitana* DNA polymerase, wherein said fragment has DNA polymerase activity; and

further wherein:

said mutant *Thermologa neapolitana* DNA polymerase has at least one mutation selected from the group consisting of:

(1) a first mutation that reduces, substantially reduces or eliminates 3'-5' exonuclease activity of said DNA polymerase, wherein said first mutation is in the 3'-5' exonuclease domain of said polymerase;

(2) a second mutation that reduces, substantially reduces or eliminates 5'-3' exonuclease activity of said DNA polymerase, wherein said second mutation is in the 5'-3' exonuclease domain of said polymerase; and

(3) a third mutation in the O-helix of said DNA polymerase, wherein said third mutation results in said DNA polymerase becoming non-discriminating against dideoxynucleotides.

6,015,669

IDENTIFICATION OF GENES

David William Holden, London, United Kingdom, assignor to Imperial College Innovations Limited, London, United Kingdom

Continuation of application No. PCT/GB95/02875, Dec. 11, 1995. This application Jun. 9, 1997, Appl. No. 871,355.

Claims priority, application United Kingdom, Dec. 9, 1994, 9424921; Jan. 31, 1995, 9501881; May 5, 1995, 9509239; Dec. 11, 1995, PCT/GB95/02875

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12Q *1/68;* G01N *33/53;* C07H *21/02;* C12N *15/00*

U.S. Cl. 435—6 **26 Claims**

1. A method for identifying a microorganism having a reduced adaptation to a particular environment comprising the steps of:

(a) providing a plurality of mutant microorganisms wherein each mutant has a gene insertionally inactivated with a nucleic acid

comprising a unique marker sequence so that each mutant contains a different marker sequence;

(b) providing individually a stored sample of each mutant of step (a) and providing individually stored nucleic acid comprising the unique marker sequence from each individual mutant;

(c) introducing a plurality of the mutants of step (a) into the said particular environment and allowing those microorganisms which are able to do so to grow in the said environment;

(d) retrieving microorganisms from the said environment or a selected part thereof and isolating the nucleic acid from the retrieved microorganisms;

(e) comparing any marker sequences in the nucleic acid isolated in step (d) to the unique marker sequence of each individual mutant stored as in step (b); and

(f) selecting an individual mutant which does not contain any of the marker sequences as isolated in step (d), wherein the selected individual mutant has a reduced adaptation to the particular environment.

6,015,670

METHODS FOR IDENTIFYING A MUTATION IN A GENE OF INTEREST WITHOUT A PHENOTYPIC GUIDE USING ES CELLS

Peter N. Goodfellow, Belsize Park, United Kingdom, assignor to Hexagen Technology Limited, Cambridge, United Kingdom

Continuation-in-part of application No. 08/857,946, May 16, 1997, Provisional application No. 60/017,824, May 17, 1996. This application Nov. 14, 1997, Appl. No. 970,740.

Int. Cl.[7] **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **4 Claims**

1. A method of identifying a mutation in a gene of interest in a tissue, comprising

mutagenizing an ES cell to produce a mutated ES cell; and

testing DNA from said mutated ES cell for a mutation in said gene of interest without the prior observation of a phenotypic alteration in said mutated ES cell.

6,015,671

MYOCARDIAL GRAFTS AND CELLULAR COMPOSITIONS

Loren J. Field, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Continuation of application No. 08/477,783, Jun. 7, 1995, Pat. No. 5,733,727. This application Nov. 21, 1997, Appl. No. 976,278.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C12Q** *1/68*

U.S. Cl. 435—6 **13 Claims**

1. A method of obtaining a population of cells enriched in a first cell lineage, comprising:

transfecting embryonic stem cells to introduce a marker gene enabling selection of a first cell lineage from other cell lineages resulting from the differentiation of the stem cells;

causing the stem cells to differentiate in vitro; and

selecting said one cell lineage based on said marker gene in vitro.

6,015,672

RAB-SPECIFIC GUANINE-NUCLEOTIDE DISSOCIATION INHIBITOR

Henry Yue, Sunnyvale; Neil C. Corley, Mountain View, and Preeti Lal, Santa Clara, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Dec. 3, 1997, Appl. No. 984,295

Int. Cl.[7] **C12Q** *1/68;* **C12P** *21/06;* **C07H** *21/02*

U.S. Cl. 435—6 **9 Claims**

1. An isolated and purified polynucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

6,015,673

CLONING AND EXPRESSION OF CDNA FOR HUMAN DIHYDROPYRIMIDINE DEHYDROGENASE

Frank J. Gonzalez, and Pedro Fernandez-Salguero, both of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of application No. 08/304,309, Sep. 12, 1994, Pat. No. 5,856,454. This application Dec. 16, 1997, Appl. No. 991,942.

Int. Cl.[7] **C12Q** *1/68;* **C12P** *15/34;* **C07H** *21/04*

U.S. Cl. 435—6 **9 Claims**

1. A method for determining whether a patient is at risk of a toxic reaction to 5-fluorouracil, the method comprising analyzing DPD DNA or mRNA in a sample from the patient, using a nucleic acid probe selected from the group that consists of SEQ ID NO:1, a specific subsequence thereof, SEQ ID NO:3, a specific subsequence thereof, and nucleic acid probes that selectively hybridize under stringent conditions to SEQ ID NO:1, to a specific subsequence thereof, to SEQ ID NO:3, to a specific subsequence thereof, and complementary sequences of all of the above, to determine the amount of intact DPD nucleic acid in the sample, wherein an enhanced risk of a toxic reaction to 5-fluorouracil is indicated by a decrease in the amount of intact DPD DNA or mRNA in the sample compared to the amount of DPD DNA or mRNA in a sample obtained from a patient known to not have a DPD deficiency.

6,015,674

APPARATUS AND METHOD FOR DETECTING NUCLEIC ACID AMPLIFICATION PRODUCTS

Timothy M. Woudenberg, Moss Beach; Kevin S. Bodner, San Mateo; Charles R. Connell, Redwood City; John Shigeura, Fremont, all of Calif.; David H. Tracy, Norwalk, and Eugene F. Young, Wilton, both of Conn., assignors to Perkin-Elmer Corporation Applied Biosystems Division, Foster City, Calif.

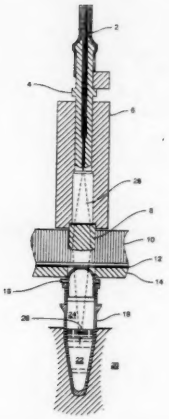
Continuation of application No. 08/752,973, Dec. 2, 1996, Pat. No. 5,928,907, which is a continuation of application No. 08/235,411, Apr. 29, 1994, abandoned. This application Mar. 20, 1998, Appl. No. 46,114.

Int. Cl.[7] **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **32 Claims**

28. A method for monitoring the formation of a nucleic acid amplification reaction product comprising:

amplifying a nucleic acid sequence in a sample in a sealed reaction chamber which includes an optical interface and an air gap between the sample and the optical interface;



delivering an excitation beam from a fiber optic cable positioned outside the sealed reaction chamber into a volume of the sample through the optical interface and the air gap; and

collecting light emitted by the volume of sample within the fiber optic cable through the optical interface and the air gap.

6,015,675

MUTATION DETECTION BY COMPETITIVE OLIGONUCLEOTIDE PRIMING

Charles Thomas Caskey, and Richard A. L. Gibbs, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation of application No. 08/469,088, Jun. 6, 1995, abandoned, which is a continuation of application No. 07/710,214, Mar. 18, 1998, abandoned. This application May 11, 1998, Appl. No. 75,967.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **22 Claims**

1. A method for detecting the presence or absence of a specific known nucleic acid sequence, or distinguishing between different sequences, comprising the steps of:

adding competitive oligonucleotide primers to a sample of nucleic acid or mixture of nucleic acids wherein at least some of the nucleic acids are polynucleotides comprising a specific known sequence, wherein said competitive oligonucleotide primers include at least two primers, a first primer being substantially complementary to the specific known sequence and at least a second primer having a base mismatch with the specific known sequence;

preferentially hybridizing the first primer to the specific known sequence under competitive conditions to form a preferentially hybridized primer complex, said complex comprising a polynucleotide comprising the specific known sequence, and the first primer, the first primer being hybridized to the polynucleotide at the specific known sequence;

extending the preferentially hybridized primer from its 3' terminus to synthesize an extension product, said extension product being complementary to the polynucleotide comprising the specific known sequence; and

identifying and detecting the presence or absence of said extension product as an indication of the presence of absence of said specific known sequence.

6,015,676

METHOD FOR KNOCKING OUT GENE TRANSCRIPTS BY COVALENTLY BINDING OF AN ANTI-SENSE PROBE

Shi-Lung Lin, Alhambra, and Shao-Yao Ying, San Marino, both of Calif., assignors to Epiclone Inc., Alhambra, Calif.

Filed Jul. 31, 1998, Appl. No. 127,368

Int. Cl.[7] **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **53 Claims**

1. A method of performing a gene knock-out technology by covalent bond formation between a targeted gene transcript and an anti-sense probe thereof, comprising the steps of:

a. providing a first strand of nucleotide sequences as a plurality of complementary probes to a targeted gene transcript, wherein said first strand of nucleotide sequences is single-stranded and carboxylated in the nucleotide base structures of said first strand of nucleotide sequences;

b. preserving said first strand of nucleotide sequences in a delivery vector, wherein said delivery vector transports said first strand of nucleotide sequences into cells;

c. contacting said first strand of nucleotide sequences with a second strand of gene transcripts in said cells, wherein said second strand of gene transcripts contains natural amino-groups in the nucleotide base structures of said second strand of gene transcripts; and

permitting said first strand of nucleotide sequences and said second strand of gene transcripts to form double-stranded hybrid duplexes comprising covalently base-pairing between the carboxyl-groups of said first strand and the amino-groups of said second strand; so as to provide covalent bond formation between said two strands of nucleotide sequences for gene knock-out.

6,015,677

ASSAY METHODS USING DNA ENCODING MAMMALIAN PHOSPHODIESTERASES

Joseph A. Beavo; Kelley J. Bentley, both of Seattle, Wash.; Harry Charbonneau, W. Lafayette, Ind., and William K. Sonnenburg, Mountlake Terrace, Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Division of application No. 08/455,525, May 31, 1995, Pat. No. 5,800,987, which is a division of application No. 08/297,494, Aug. 29, 1994, Pat. No. 5,580,771, which is a division of application No. 07/872,644, Apr. 20, 1992, Pat. No. 5,389,527, which is a continuation-in-part of application No. 07/688,356, Apr. 19, 1991, abandoned. This application Aug. 25, 1998, Appl. No. 139,491.

Int. Cl.[7] **C12Q** *1/68*

U.S. Cl. 435—6 **4 Claims**

1. An assay method for identifying a chemical agent which modifies the enzymatic activity of a mammalian cyclic GMP stimulated nucleotide phosphodiesterase said method comprising:

(a) stably transforming with a polynucleotide encoding a mammalian cyclic GMP stimulated nucleotide phosphodiesterase selected from the group consisting of:

(i) a polynucleotide encoding the amino acid sequence of SEQ ID NO: 39;

(ii) a polynucleotide encoding the amino acid sequence of SEQ ID NO: 43;

(iii) a polynucleotide encoding the amino acid sequence of SEQ ID NO: 45;

(iv) a polynucleotide which hybridizes under stringent hybridization conditions to an antisense strand of the DNA insert in vector p3CGS-5 (A.T.C.C. 68579), pHcgs6n (A.T.C.C. 68962), pGSPDE6.1 (A.T.C.C. 68583), pGSPDE7.1 (A.T.C.C. 68585), or pBBCGSPDE-5 (A.T.C.C. 68578); and

(v) a polynucleotide encoding the same polypeptide as (iv) by means of degenerate codons;

a eukaryotic host cell having a heat-shock sensitivity phenotypic character susceptible to alteration, such that upon expression of said polynucleotide sequence said cell exhibits an altered heat-shock phenotype;

(b) growing the transformed host cell formed in step (a) in a nutrient medium under conditions allowing expression of said polynucleotide sequence in said transformed host cell accompanied by the corresponding alteration in the transformed host cell phenotype;

(c) contacting the transformed host cells grown according to step (b) with a chemical agent to be assayed; and

(d) determining if the chemical agent step (c) modifies the enzymatic activity of the enzyme of step (a) by determining if the altered heat-shock phenotype of the cells of step (c) has been modified.

6,015,678

METHOD FOR DETECTION OF A POLYNUCLEOTIDE ENCODING PROTEIN KINASE C INHIBITOR-HOMOLOG

Jennifer L. Hillman, Mountain View, Calif., assignor to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Division of application No. 08/812,828, Mar. 6, 1997, Pat. No. 5,922,571. This application Feb. 4, 1999, Appl. No. 244,192.

Int. Cl.[7] **C12Q** *1/68;* **C07K** *14/52;* **C12N** *15/19;* **A61K** *38/17*

U.S. Cl. 435—6 **3 Claims**

1. A method for detection of a polynucleotide which encodes the polypeptide comprising the amino acid sequence of SEQ ID NO:1 in a biological sample containing nucleic acids, the method comprising the steps of:

a) contacting the nucleic acids with a polynucleotide sequence which is complementary to SEQ ID NO:2 under conditions suitable for formation of a hybridization complex; and

b) detecting the hybridization complex, wherein the presence of the complex correlates with the presence of the polynucleotide encoding the polypeptide in the biological sample.

6,015,679

PROCESS FOR MEASURING COMPLEMENT ACTIVITY AND REAGENT USED THEREFOR

Kazuhisa Kubotsu; Sachiko Yamamoto, and Masaaki Kida, all of Amagasaki, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Division of application No. 08/756,363, Nov. 26, 1996, Pat. No. 5,854,082, which is a continuation of application No. 08/300,318, Sep. 2, 1994, abandoned. This application May 20, 1998, Appl. No. 81,675.

Claims priority, application Japan, Sep. 7, 1993, 5-246332; Nov. 17, 1993, 5-311229

Int. Cl.[7] **G01N** *33/53*

U.S. Cl. 435—7.1 **12 Claims**

1. A process for measuring human complement activity, which comprises:

reacting liposomes having a size within the range of 100 to 500 nm,

the size being a mean particle size in nm plus twice the standard deviation, which is obtained and calculated from a particle size distribution measured by a dynamic light scattering method, said liposomes also having an encapsulated marker therein and an immobilized hapten on surface of the liposome membranes capable of reacting with an unbound antibody,

with the unbound antibody to the hapten and a sample containing human complement, whereby said liposomes are ruptured by reaction with the complement;

measuring an amount of liberated marker according to the degree of rupture of the liposomes and

measuring human complement activity in the sample on the basis of the amount of liberated marker thus obtained.

6,015,680

HUMAN LUNG ADENOCARCINOMA-RELATED MONOCLONAL ANTIBODY AND IMMUNOASSAY METHOD WHICH USES THE SAME

Kouichi Tsuji; Yoshihiro Yoshida, and Takashi Uwano, all of Kanagawa, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP96/00613, § 371 Date Sep. 12, 1997, § 102(e) Date Sep. 12, 1997, PCT Pub. No. WO96/28569, PCT Pub. Date Sep. 19, 1996

PCT Filed Mar. 13, 1996, Appl. No. 913,315

Claims priority, application Japan, Mar. 13, 1995, 7-052260; Apr. 20, 1995, 7-094071

Int. Cl.[7] **A61K** *39/395;* **G01N** *33/53;* **C07K** *16/30*

U.S. Cl. 435—7.23 **9 Claims**

1. A monoclonal antibody or antigen binding fragment thereof, which antibody specifically binds to a human pulmonary adenocarcinoma cell antigen wherein said monoclonal antibody is produced by a hybridoma selected from the group consisting of FERM BP-5383, FERM P-14879 and FERM P-14880.

4. An immunoassay method for diagnosis of human pulmonary adenocarcinoma which comprises contacting a sample of a subject suspected of having human pulmonary adenocarcinoma with a monoclonal antibody or fragment according to claim **1** and correlating whether the subject has pulmonary adenocarcinoma based on the binding or absence of binding of said antibody to any human pulmonary adenocarcinoma antigen contained in said sample, wherein said human pulmonary adenocarcinoma antigen is the antigen specifically bound by said monoclonal antibody or fragment thereof.

6,015,681

RAPID IMMUNOASSAY FOR CARIOGENIC BACTERIA

Stephen Alden Ralls, Great Lakes, and Lloyd Grant Simonson, Spring Grove, both of Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of application No. 08/508,653, Jul. 28, 1995, abandoned. This application Dec. 12, 1996, Appl. No. 766,203.

Int. Cl.[7] **G01N** *33/554;33/53;33/537;33/543*

U.S. Cl. 435—7.32 **9 Claims**

1. A method for semiquantitatively detecting, in less than 30 minutes, a predesignated, target cariogenic bacteria in a sample selected from the group consisting of human dental plaque, saliva, and oral rinse which comprises the following steps:

(a) treating the sample with a antibody stripping buffer that removes all host antibodies from any target cariogenic bacteria present in the sample and said buffer does not support an antigen/antibody interaction;

(b) spotting onto and filtering the stripping buffer treated bacteria suspension or solution through a blocked solid phase substrate thereby retaining the treated target bacteria in a spot on the blocked solid phase substrate;

(c) reacting the retained treated target bacteria spot with a primary antibody specific for the target cariogenic bacteria;

(d) previously, simultaneously or subsequently to said primary antibody reacting with the target cariogenic bacteria reacting the primary antibody with a conjugated label producing a detectable signal; and

(e) detecting the signal whereby the presence of the target bacteria is determined in the sample by the intensity of the signal.

6,015,682

FACTORS WHICH MODIFY GENE TRANSCRIPTION AND METHODS OF USE THEREFOR

Richard A. Young, Weston; Anthony J. Koleske, Braintree, both of Mass.; Craig M. Thompson, New Haven, Conn., and David M. Chao, Cambridge, Mass., assignors to Whitehead Institute for Biomedical Research, Cambridge, Mass.

Continuation-in-part of application No. 08/218,265, Mar. 25, 1994. This application Aug. 31, 1995, Appl. No. 521,872.

Int. Cl.[7] **C12Q** *1/48;* **C12N** *9/12;* **C07K** *1/00*

U.S. Cl. 435—15 **4 Claims**

1. A method of identifying a substance that modifies gene transcription, comprising the steps of:

a) combining:

(i) DNA to be transcribed;

(ii) transcription factor a, or a homolog thereof;

(iii) TATA-binding protein;

(iv) a test substance to be assessed for its ability to modify gene transcription; and

(v) a purified RNA polymerase II holoenzyme preparation comprising general transcription factors b, g, and e and at least eight SRB proteins, wherein said SRB polypeptides are selected from the group consisting of SRB2, SRB4, SRB5, SRB6, SRB7, SRB8, SRB9, SRB10, and SRB11, and wherein at least one of said SRB polypeptides binds specifically to a polyclonal antibody raised against *S. cerevisiae* SRB2, SRB4, SRB5, SRB6, SRB7, SRB8, SRB9, or human SRB7, thereby producing a test mixture;

(b) maintaining the test mixture of step a) under conditions sufficient for transcription of the DNA; and

(c) determining the extent to which DNA transcription occurs in the test mixture and comparing the result of such determination with the extent to which DNA transcription occurs in a DNA transcription reaction according to steps a) and b) in the absence of said test substance; said test substance being one that modifies gene transcription when DNA transcription occurs to a lesser or greater extent in said test mixture than in said DNA transcription reaction performed in the absence of test substance.

6,015,683

DRY ANALYTICAL ELEMENT FOR ACETAMINOPHEN ASSAY

James Robert Schaeffer, Penfield; John Charles Mauck, Rochester; Robert Francis Winterkorn, Rochester, and Thomas Charles Arter, Rochester, all of N.Y., assignors to Clinical Diagnostic Systems, Inc., Rochester, N.Y.

Filed Jul. 15, 1992, Appl. No. 914,915

Int. Cl.[7] **C12Q** *1/37;1/26;1/28;1/00*

U.S. Cl. 435—24 **8 Claims**

1. An analytical element for the determination of acetaminophen in an aqueous fluid comprising a support having thereon at least one reagent layer and containing in said reagent layer:

(a) aryl acylamidase;

(b) an enzyme selected from the group consisting of ascorbic acid oxidase, tyrosinase and laccase; and

(c) 1-(3-sulfopropyl)-1,2,3,4-tetrahydroquinoline.

6,015,684

ASTAXANTHIN OVER-PRODUCING STRAINS OF *PHAFFIA RHODOZYMA* METHOD FOR THEIR CULTIVATION AND THEIR USE IN ANIMAL FEEDS

Gunnard Kenneth Jacobson, Brown Deer; Setsuko Omata Jolly, Glendale; Joseph James Sedmak, Brookfield; Thomas Joseph Skatrud, Menomonee Falls, and John Marion Wasileski, Brown Deer, all of Wis., assignors to Archer-Daniels-Midland Company, Decatur, Ill.

Division of application No. 08/557,714, Nov. 13, 1995, Pat. No. 5,922,560, which is a continuation of application No. 08/049,825, Apr. 19, 1993, Pat. No. 5,466,599. This application Nov. 10, 1997, Appl. No. 967,034.

Int. Cl.[7] **C12P** *23/00;* **C12N** *1/16*

U.S. Cl. 435—67 **19 Claims**

1. A fermentation method for the production of astaxanthin from a strain of *Phaffia rhodozyma*, the method comprising cultivating cells of the strain under suitable conditions in a nutrient medium containing a rapidly metabolized energy source that is maintained over at least part of the cultivation at a level such that the strain experiences (i) a growth phase during which its cells increase rapidly in number and produce astaxanthin, and during which the energy source is fed to the strain at a rate such that it does not accumulate in the medium in excess of a predetermined level, followed by (ii) a maturation phase, during which the increase in cell number slows but the astaxanthin production continues at a rate at least as great as the rate during the growth phase, in which the maturation phase is extended by the following:

(a) reducing and maintaining the external feed rate of the rapidly metabolized energy source at a level that is no more than about 50% of the rate at which said energy source was fed to the strain at the close of the growth phase; or

(b) stopping the external feed of the rapidly metabolized energy source and replacing it, at the start of the maturation phase, with an external source of a slowly metabolized energy source.

6,015,685

ANCROD PROTEINS, THEIR PREPARATION AND USE

Alfred Bach, Ladenburg; Karl-Hermann Strube, Speyer, and Wolfgang Koerwer, Gruenstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP89/01427, § 371 Date May 14, 1991, § 102(e) Date May 14, 1991, PCT Pub. No. WO90/06362, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 25, 1989, Appl. No. 690,957

Claims priority, application Germany, Dec. 10, 1988, 38 41 736

Int. Cl.[7] **C12N** *15/12;* **C07H** *21/04*

U.S. Cl. 435—69.1 **6 Claims**

1. A purified glycosylated, partially glycosylated or unglycosylated polypeptides having the following amino-acid sequence:

```
1    VIGGDECNIN EHRFLVAVYE GTX[1]WTFICGG VLIHPEWVIT
     AEHCARRRMN
51   LVFGMHRKSE KFDDEQERYP KKRYFIRCX[2]K TRTSWDEDIM
     LIRLNKPVX[3]N
101  SEHIAPLSLP SNPPIVGSDC RVMGWGSINR RIHVLSDEPR
     CANINLHX[4]FT
151  MCHGLFRKMP KKGRVLCAGD LRGRRDSCNS DSGGPLICNE
     ELHGIVARGP
201  NPCAQPNKPA LYTSVYDYRD WVNNVIAGX[5]A TCSP,
```

where X^1, X^2, X^3, X^4 and X^5 are residues of natural α-amino acids.

6,015,686

EUKARYOTIC LAYERED VECTOR INITIATION SYSTEMS

Thomas W. Dubensky, Jr., Rancho Sante Fe; John M. Polo, San Diego; Douglas J. Jolly, Leucadia, and David A. Driver, San Diego, all of Calif., assignors to Chiron Viagene, Inc., Emeryville, Calif.

Continuation-in-part of application No. 08/376,184, Jan. 20, 1995, abandoned, which is a continuation-in-part of application No. 08/348,472, Nov. 30, 1994, abandoned, which is a continuation-in-part of application No. 08/198,450, Feb. 18, 1994, abandoned, which is a continuation-in-part of application No. 08/122,791, Sep. 15, 1993, abandoned. This application Mar. 15, 1995, Appl. No. 404,796.

Int. Cl.[7] C12P *21/02;* C12N *15/00;15/63;15/11*

U.S. Cl. 435—69.1 20 Claims

1. A eukaryotic layered vector initiation system comprising a eukaryotic promoter 5' of viral cDNA which initiates within a cell the 5' to 3' synthesis of RNA from cDNA, wherein said RNA comprises a vector construct which autonomously amplifies in a cell, said vector construct expressing a heterologous nucleic acid sequence.

6,015,687

APOPTOSIS-MODULATING PROTEINS, DNA ENCODING THE PROTEINS AND METHODS OF USE THEREOF

Michael C. Kiefer, Clayton, and Philip J. Barr, Berkeley, both of Calif., assignors to LXR Biotechnology Inc., Richmond, Calif.

Division of application No. 08/320,157, Oct. 7, 1994, which is a continuation-in-part of application No. 08/160,067, Nov. 30, 1993, abandoned. This application Jun. 6, 1995, Appl. No. 471,057.

Int. Cl.[7] C12N *15/00;15/09;15/63*

U.S. Cl. 435—69.1 1 Claim

1. A method of modulating the level of an apoptosis-modulating protein in a cell in vitro, comprising the steps of:

providing a cell in vitro; and

introducing into the cell a polynucleotide encoding a CDN protein, wherein the CDN protein is a homologue of bcl-2 and is selected from the group consisting of a CDN-1 comprising the amino acid sequence of SEQ ID NO: 7, and a CDN-2 comprising the amino acid sequence of SEQ ID NO: 9; and wherein said polynucleotide encoding a CDN protein is expressed at a level sufficient to modulate apoptosis in the cell.

6,015,688

TRANSFERRIN RECEPTOR GENES

Sheena Loosmore, Aurora; Robin Harkness, Willowdale; Anthony Schryvers, Calgary; Pele Chong, Richmond Hill; Scott Gray-Owen, Calgary; Yan-Ping Yang, Willowdale; Andrew Murdin, Newmarket, and Michel Klein, Willowdale, all of Canada, assignors to Connaught Laboratories Limited, North York, Canada

Continuation of application No. 08/337,483, Nov. 8, 1994, which is a continuation-in-part of application No. 08/175,116, Dec. 29, 1993, abandoned, which is a continuation-in-part of application No. 08/148,968, Nov. 8, 1993, abandoned. This application Jun. 7, 1995, Appl. No. 483,577.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12P *21/06;21/04;* C12N *1/12;15/00*

U.S. Cl. 435—69.1 7 Claims

1. An isolated and purified nucleic acid molecule which encodes an immunogenic truncated analog of a transferrin receptor protein selected from the group consisting of Tbp1 and Tbp2 proteins of a strain of Haemophilus and which is truncated from the C-terminus of the transferrin receptor protein.

6,015,689

REGULATION OF AUREOBASIDIN SENSITIVITY

Takashi Okado, Kyoto-fu; Kazutoh Takesako, Shiga-ken, and Ikunoshin Kato, Kyoto-fu, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto-fu, Japan

Continuation-in-part of application No. 08/243,403, May 16, 1994. This application Jun. 29, 1995, Appl. No. 492,459.

Claims priority, application Japan, May 24, 1993, 5-142523; Dec. 28, 1993, 5-348893; Jun. 29, 1994, 6-168611; Mar. 30, 1995, 7-095831; Mar. 30, 1995, 7-095955; May 17, 1995, 7-141393

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12N *15/00*

U.S. Cl. 435—69.1 29 Claims

1. An isolated DNA comprising a nucleic acid sequence which encodes the amino acid sequence according to SEQ ID NO. 2, 4, 6, 8, 10, 14, 16 or 22.

6,015,690

DNA SEQUENCE ENCODING A HUMAN IMIDAZOLINE RECEPTOR AND METHOD FOR CLONING THE SAME

John E. Piletz, Madison, and Tina R. Ivanov, Jackson, both of Miss., assignors to The University of Mississippi Medical Center, Jackson, Miss.

Provisional application No. 60/012,600, Mar. 1, 1996. This application May 20, 1996, Appl. No. 650,766.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12N *15/12*

U.S. Cl. 435—69.1 4 Claims

1. An isolated DNA molecule comprising a nucleotide sequence shown in SEQ ID NO: 1, 2, 3, 4 or 5 operably linked with a promoter sequence, wherein said molecule encodes an imidazoline receptive protein.

6,015,691

IMMUNODOMINANT 120 KDA SURFACE-EXPOSED ADHESION PROTEIN GENES OF *EHRLICHIA CHAFFEENSIS*

David H. Walker, and Xue-Jie Yu, both of Galveston, Tex., assignors to Research Development Foundation, Carson, Nev.

Filed May 31, 1996, Appl. No. 656,034

Int. Cl.[7] C12N *15/00;15/31;* C07K *14/00;* A61K *39/02*

U.S. Cl. 435—69.1 25 Claims

1. An isolated nucleic acid segment encoding a 120 kDa protein, wherein said protein is immunoreactive with anti-*Ehrlichia chaffeensis* serum, and wherein said protein has an amino acid sequence of SEQ ID NO:2 or SEQ ID NO:10.

6,015,692

CDC37 CELL-CYCLE REGULATORY PROTEIN AND USES RELATED THERETO

Jeno Gyuris, Winchester; Lou Lamphere, Boston, both of Mass., and Giulio Draetta, Milan, Italy, assignors to Mitotix, Inc., Cambridge, Mass.

Continuation of application No. 08/625,209, Apr. 1, 1996, Pat. No. 5,756,671, which is a continuation-in-part of application No. 08/466,679, Jun. 6, 1995, abandoned, which is a continuation-in-part of application No. 08/253,155, Jun. 2, 1994, Pat. No. 5,691,147. This application May 9, 1997, Appl. No. 853,733.

Int. Cl.[7] C12P *21/06;* C12N *9/00;15/00;* C07H *17/00*

U.S. Cl. 435—69.1 26 Claims

1. A substantially pure nucleic acid encoding a recombinant polypeptide comprising a cdc37 amino acid sequence at least 80% identical to the amino acid sequence designated by SEQ ID no. 2, or a portion of said cdc37 amino acid sequence, wherein said

recombinant polypeptide or a portion thereof specifically binds to at least one of a cyclin-dependent kinase (CDK) and an extracellular-signal regulated kinase (erk).

6,015,693

RECOMBINANT PRODUCTION OF SOLUBLE TGF-β-BINDING ENDOGLIN POLYPEPTIDES

Michelle Letarte, Toronto, Canada; Joan Massague, New York, N.Y.; Carmelo Bernabeu, Madrid, Spain, and Sela Cheifetz, Concord, Canada, assignors to Telios Pharmaceuticals, Inc., San Diego, Calif.

Division of application No. 07/968,953, Oct. 30, 1992, Pat. No. 5,830,847. This application Mar. 25, 1998, Appl. No. 47,645.

Int. Cl.[7] **C12N** *15/12;* **A61K** *38/17*

U.S. Cl. 435—69.1 **12 Claims**

1. A nucleic acid molecule which upon translation affords a soluble polypeptide, wherein said polypeptide comprises the amino acid sequence of a polypeptide fragment of an endoglin protein, wherein said polypeptide fragment binds to TGF-β; provided that the soluble polypeptide does not comprise the complete amino acid sequence of an endoglin protein.

6,015,694

METHOD FOR STIMULATING AN IMMUNE RESPONSE UTILIZING RECOMBINANT ALPHAVIRUS PARTICLES

Thomas W. Dubensky, Jr., Rancho Sante Fe; John M. Polo; Steven M.W. Chang, both of San Diego, and Douglas J. Jolly, Leucadia, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of application No. 08/404,796, Mar. 15, 1995, which is a continuation-in-part of application No. 08/376,184, Jan. 18, 1995, abandoned, which is a continuation-in-part of application No. 08/348,472, Nov. 30, 1994, abandoned, which is a continuation-in-part of application No. 08/198,450, Feb. 18, 1994, abandoned, which is a continuation-in-part of application No. 08/122,791, Sep. 15, 1993, abandoned. This application Sep. 16, 1997, Appl. No. 931,869.

Int. Cl.[7] **C12P** *21/06*

U.S. Cl. 435—69.3 **11 Claims**

1. A method of stimulating in an animal an immune response to an antigen, comprising infecting susceptible animal target cells with recombinant alphavirus particles comprising a vector which directs the expression of at least one antigen or modified form thereof in target cells infected with the alphavirus, wherein said antigen or modified form thereof stimulates an immune response within an animal, and wherein said recombinant alphavirus particles are obtained from an alphavirus packaging cell comprising a stably transformed expression cassette which expresses an alphavirus structural protein, which, after introduction of an alphavirus vector construct, produces recombinant alphavirus particles.

6,015,695

IMMUNOGLOBULINS DEVOID OF LIGHT CHAINS

Cecile Casterman, and Raymond Hamers, both of Sint-Genesius-Rode, Belgium, assignors to Vrije Universiteit Brussel, Brussels, Belgium

Division of application No. 08/106,944, Aug. 17, 1993, abandoned. This application Jun. 6, 1995, Appl. No. 468,739.

Claims priority, application European Pat. Off., Aug. 21, 1992, 92402326; May 21, 1993, 93401310

Int. Cl.[7] **C12N** *7/01;15/63;* **C12P** *21/08;* **C07H** *21/04*

U.S. Cl. 435—69.6 **13 Claims**

1. An immunoglobulin comprising two heavy polypeptide chains, each heavy chain consisting of a complete antigen binding site, said immunoglobulin containing a variable (V_{HH}) region and a constant region, said constant region being devoid of first constant domain C_H1, wherein the immunoglobulin is devoid of polypeptide light chains, wherein said immunoglobulin is obtainable by a process comprising the steps of:

obtaining a first DNA or cDNA sequence coding for a V_{HH} domain or part thereof having a determined specificity against a given antigen and comprised between Xho and Spe sites, obtaining a second DNA or cDNA sequence coding for a V_{HH} domain or part thereof, having a determined specificity different from the specificity of the first DNA or cDNA sequence and comprised between the Spe and EcoRI sites;

digesting an immuno PBS vector with EcoRI and XhoI restriction enzymes, ligating the obtained DNA or cDNA sequence coding for V_{HH} domains so that the DNA or cDNA sequences are serially cloned in the vector;

transforming a host cell by transfection; and

recovering the immunoglobulins.

6,015,696

MYCOBACTERIAL SECRETORY EXPRESSION VECTORS AND TRANSFORMANTS

Takeshi Yamada, Nagasaki-ken; Kazuhiro Matsuo, Kaswaski; Ryuji Yamaguchi, Kawasaki, and Akihiro Yamazaki, Kawasaki, all of Japan, assignors to Ajinomoto, Co., Inc., Tokyo, and Takeshi Yamada, Nagasaki-ken, both of Japan

Continuation of application No. 07/531,448, May 31, 1990, abandoned. This application Feb. 9, 1994, Appl. No. 193,899.

Claims priority, application Japan, May 31, 1989, 1-135855; Mar. 16, 1990, 2-64310

Int. Cl.[7] **C12N** *1/21;15/74;* **C12P** *21/00;21/02*

U.S. Cl. 435—69.8 **9 Claims**

1. A transformant of *Mycobacterium bovis* BCG that secretes a heterologous polypeptide which has been transformed with a vector, said vector comprising:

a promoter, a signal sequence of *Mycobacterium kansasii*-derived α antigen, a DNA nucleotide sequence encoding a heterologous polypeptide, and a replicator region for replication in mycobacteria.

6,015,697

METHOD FOR PRODUCING NUCLEOSIDE-5'-PHOSPHATE ESTER

Yasuhiro Mihara, Kawasaki; Takashi Utagawa, Tokyo; Hideaki Yamada, Kyoto, and Yasuhisa Asano, Toyama-ken, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 21, 1997, Appl. No. 975,698

Claims priority, application Japan, Nov. 21, 1996, 8-311103; Jun. 18, 1997, 9-161674

Int. Cl.[7] **C12P** *19/38*

U.S. Cl. 435—87 **14 Claims**

1. A method for producing a nucleoside -5'-phosphate ester comprising the steps of effecting a transphosphorylation reaction by reacting (1) a nucleoside selected from the group consisting of inosine, guano sine, adenosine, xanthosine, purine riboside, 6-methoxypurine riboside, 2,6-diaminopurine riboside, 6-fluoropurine riboside, 6-thiopurine riboside, 2-amino-6-thiopurine riboside, mercaptoguanosines uridine, cytidine, 5-aminouridine, 5-hydroxyuridine, 5-bromouridine and 6-azauridine and (2) a phosphate group donor selected from the group consisting of polyphosphoric acid or salt thereof, phenylphosphoric acid or salt thereof, carbamyl phosphate or salt thereof and acetylphosphoric acid or salt thereof in the presence of an acid phosphatase, in solution at a pH of 3.0 to 5.5 to produce a nucleoside -5-phosphate ester and isolating the nucleoside -5'-phosphate, wherein the acid phosphatase comprises an amino acid sequence which is an amino acid sequence selected from the group consisting of SEQ ID NO: 4, 8, 24, 26 and 28 and said acid phosphatase has a mutation which decreases the K_m value for the

nucleoside and/or increases the temperature stability as compared to said amino acid sequence selected from the group consisting of SEQ ID NO: 4, 8, 24, 26 and 28, wherein the K_m value for the nucleoside is determined by measuring the transphosphorylation activity of the acid phosphatase at 30° C. and pH 4.0 in the presence of 100 μmol/ml of sodium pyrophosphate.

6,015,698

METHOD OF PRODUCING D-AMINO ACID AND METHOD OF PRODUCING AMINE

Teruyuki Nikaido, Tsukuba, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan

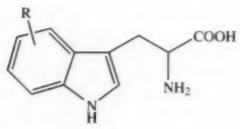
Filed Feb. 13, 1998, Appl. No. 23,884

Int. Cl.[7] C12P *13/04;13/22*

U.S. Cl. 435—106 **16 Claims**

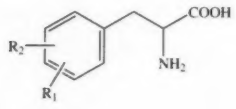
1. A method of isolating a D-amino acid, the method comprising (A) contacting a mixture of enantiomers of an amino acid represented by formula (1-A) or formula (1-B)

(1-A)



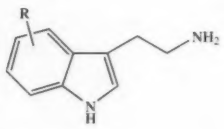
wherein R represents H or OH,

(1-B)



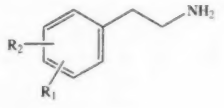
and each of R_1 and R_2 independently represents H or OH, with a microorganism that selectively degrades an L-amino acid of the amino acid represented by formula (1-A) or formula (1-B) to produce an amine represented by formula (2-A) or formula (2-B)

(2-A)



wherein R represents H or OH,

(2-B)



and each of R_1 and R_2 independently represents H or OH, and (B) recovering a D-amino acid from said mixture.

6,015,699

PROCESS FOR THE PRODUCTION OF ALCOHOL

Shamrao Ganpatrao Patil; Bhaskar Ganpatrao Patil; Digambar Vitthal Gokhale; Kulbhushan Balwant Bastawde; Ulka Shrirang Puntambekar, and Prabhakar Kamalakar Ranjekar, all of Maharashtra, India, assignors to Council of Scientific & Industrial Research, New Delhi, India

Filed Mar. 25, 1998, Appl. No. 47,988

Claims priority, application India, Sep. 30, 1997, 2783/97

Int. Cl.[7] C12P *7/06;7/08;7/010*

U.S. Cl. 435—161 **3 Claims**

1. An improved process for the production of alcohol which comprises growing yeast saccharomyces sp. in a conventional growth medium of MGYP and a fermenting medium containing carbon and nitrogen sources and at least 0.25% by weight on dry weight of fruit supplements selected from the group consisting of banana (*Musa paradisiaca*), chiku (Sapota, *Achras sapotaa*), custard apple (*Annona sqamosa*), mosambi (*Citrus sinensis*), orange (*Citrus reticulata*), apple (*Malus sylvestris*), pineapple (*Ananas sativus*), papaya (*Carica papaya*), guava (*Psidium guavava*), ber (*Zyzypus jujuba*), pomegranate (*Punica granmatum*), mango (*Mangifera indica*) and tamarind (*Tamarindus indica*), in the form of the whole fruit, or the husk, pulp, or a powder and mixtures thereof; allowing the resultant broth to ferment for at least 15 hours at a temperature in the range of 15–37° C.; and recovering the alcohol.

6,015,700

CDC2 PROTEIN KINASE FROM *PNEUMOCYSTIS CARINII*

Andrew H. Limper; Edward B. Leof; Charles F. Thomas, and Michael P. Gustafson, all of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Division of application No. 08/874,347, Jun. 13, 1997, Pat. No. 5,863,741. This application Jun. 8, 1998, Appl. No. 93,522.

Int. Cl.[7] C12N *9/00;* **C12P** *21/06;* **C07H** *17/00*

U.S. Cl. 435—183 **6 Claims**

1. An isolated polynucleotide molecule encoding a *Pneumocystis carinii* Cdc2 polypeptide having the amino acid sequence set forth in SEQ ID NO:10.

6,015,701

N-ACETYLGLUCOSAMINYLTRANSFERASE V PROTEINS AND CODING SEQUENCES

James Michael Pierce, Athens; Mohamed G. Shoreibah, Comer, both of Ga.; Beverly Adler, Newbury Park, Calif., and Nevis Lee Fregien, Miami, Fla., assignors to University of Georgia Research Foundation, Inc., Athens, Ga., and Amgen, Inc., Thousand Oaks, Calif.

Continuation-in-part of application No. 08/016,863, Feb. 10, 1993, Pat. No. 5,602,003, which is a continuation-in-part of application No. 07/905,795, Jun. 29, 1992, abandoned. This application Jul. 19, 1994, Appl. No. 276,968.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12N *15/54;15/74;15/85*

U.S. Cl. 435—193 **31 Claims**

1. A non-naturally occurring DNA molecule comprising a nucleotide sequence encoding a polypeptide having N-acetylglucosaminyl transferase V (GlcNAc T-V) activity.

6,015,702

HUMAN UBIQUITIN-CONJUGATING ENZYMES

Preeti Lal, Santa Clara; Jennifer L. Hillman, and Neil C. Corley, both of Mountain View, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of application No. 08/933,750, Sep. 23, 1997. This application Nov. 6, 1997, Appl. No. 965,689.

Int. Cl.[7] **C12N** *9/10;1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—193 **9 Claims**

1. An isolated and purified polynucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

6,015,703

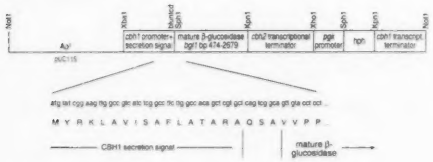
GENETIC CONSTRUCTS AND GENETICALLY MODIFIED MICROBES FOR ENHANCED PRODUCTION OF BETA-GLUCOSIDASE

Theresa C. White, and Christopher D. Hindle, both of Ottawa, Canada, assignors to Iogen Corporation, Ottawa, Canada

Filed Mar. 10, 1998, Appl. No. 37,524

Int. Cl.[7] **C12N** *9/42;1/14;15/00;* **C07H** *21/04*

U.S. Cl. 435—209 **29 Claims**



1. A genetically modified microbe comprising:

a microbe selected from the group consisting of Trichoderma, Humicola, Fusarium, and Aspergillus; and

a genetic construct that has been introduced into said microbe, said genetic construct having a promoter selected from the group consisting of cbh1, cbh2, eg1, eg2, eg3, eg5, xln1 and xln2,

a xylanase secretion signal, and

a mature beta-glucosidase coding region,

wherein said genetically modified microbe produces an increased level of beta-glucosidase relative to said microbe.

6,015,704

MUTANT ASPARTASE AND THE PREPARATION THEREOF

Hsin Tsai; Jin-Tann Chen, and Hsiu-Hui Chen, all of Taipei, Taiwan, assignors to Development Center for BioTechnology, Taipei, Taiwan

Filed Apr. 18, 1997, Appl. No. 843,982

Claims priority, application China, Jan. 31, 1997, 86101167

Int. Cl.[7] **C12N** *9/88*

U.S. Cl. 435—232 **7 Claims**

1. A mutant aspartase comprising the amino acid sequence of wild-type *Escherichia coli* aspartase wherein the amino acid residue at one of positions 25, 123, 421 and 463 of SEQ ID NO: 8 is substituted.

6,015,705

METHOD OF MODIFYING THE DNA OF AN ORGANISM, DNA SEQUENCE, METHOD OF DETECTION AND ISOLATION OF A GENE CAPABLE OF MODIFYING THE DNA OF AN ORGANISM AND ORGANISMS COMPRISING MODIFIED DNA

Jan W. Vrijbloed, Zurich, Switzerland, and Lubbert Dijkhuizen, Zuidlaren, Netherlands, assignors to Rijksuniversiteit Groningen, Groningen, Netherlands

Provisional application No. 60/001,381, Jul. 24, 1995. This application Jul. 24, 1996, Appl. No. 685,466.

Int. Cl.[7] **C12N** *1/21*

U.S. Cl. 435—252.1 **14 Claims**

1. A method of modifying DNA by subjecting the DNA to a mutation-inducing treatment, said method comprising the steps of bringing the DNA to be mutated and a DNA sequence encoding a mutation-inducing non-DNA polymerase protein together in cells, said DNA sequence consisting of the sequence of nucleotides 34 to 612 of SEQ ID NO. 3, also shown as the "mut" gene in FIG. **4**, or sequences encoding functional fragments thereof, growing the cells in the presence of a stress factor, and selecting the mutant cells which have developed a desirable trait in the presence of said stress factor.

6,015,706

MICROORGANISM RESISTANT TO HYDROGEN PEROXIDE

In-seop Kim, Seoul; Seung-uhn Kim, Pusan; Nam-hee You, and Soon-young Lee, both of Kyunjki-do, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 20, 1998, Appl. No. 27,302

Claims priority, application Rep. of Korea, Feb. 25, 1997, 97-5704

Int. Cl.[7] **C12N** *1/20*

U.S. Cl. 435—252.1 **2 Claims**

1. A biologically pure culture of a strain of *Micrococcus luteus* resistant to hydrogen peroxide that has a linear survival curve in relation to hydrogen peroxide concentration, having all of the identifying characteristics of *Micrococcus luteris* KCTC 0369BP.

6,015,707

TREATING CELLULOSIC MATERIALS WITH CELLULASES FROM CHRYSOSPORIUM

Mark Aaron Emalfarb, Jupiter, Fla.; Arie Ben-Bassat, Wilmington, Del., and Arkady Panteleimonovich Sinitsyn, Moscow, Russian Federation, assignors to Mark A. Emalfarb, Jupiter, Fla.

Division of application No. 08/731,170, Oct. 10, 1996, Pat. No. 5,811,381. This application Jun. 29, 1998, Appl. No. 106,026.

Int. Cl.[7] **D06M** *16/00;* **D21C** *1/00;3/00;* **C09B** *67/00*

U.S. Cl. 435—263 **50 Claims**

1. A method of enzymatically treating cellulosic fibers or fabrics, comprising treating said fibers or fabrics with a neutral and/or alkaline cellulase whose amino acid sequence is encoded by a nucleic acid sequence from a fungus of the genus Chrysosporium, provided that, when said method is carried out at a pH below 7.0, said fungus is not *Chrysosporium pruinosum.*

6,015,708

GENE MANIPULATION AND EXPRESSION USING GENOMIC ELEMENTS

Stephen Sherwin, San Francisco; Sue Klapholz, Stanford, both of Calif., and Arthur Skoultchi, Larchmont, N.Y., assignors to Cell Genesys, Inc., Foster City, Calif.

Continuation of application No. 08/102,567, Aug. 5, 1993, Pat. No. 5,578,461, which is a continuation of application No. 08/001,898, Jan. 7, 1993, abandoned, which is a continuation of application No. 07/696,216, May 6, 1991, abandoned, which is a continuation-in-part of application No. 07/432,069, Nov. 6, 1989, abandoned. This application Jun. 5, 1995, Appl. No. 462,947.

Claims priority, application WIPO, Nov. 6, 1990, PCT/US90/06425

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12N *1/19;5/10;15/81;15/85*

U.S. Cl. 435—325 **21 Claims**

1. A yeast artificial chromosome comprising mammalian DNA that includes a mammalian target gene, wherein a nucleotide regulatory sequence, heterologous to the mammalian target gene, is in operable association with the mammalian target gene such that the nucleotide regulatory sequence directs expression of the mammalian target gene when the yeast artificial chromosome is present in a mammalian cell.

6,015,709

TRANSCRIPTIONAL ACTIVATORS, AND COMPOSITIONS AND USES RELATED THERETO

Sridaran Natesan, Chestnut Hill, Mass., assignor to ARIAD Pharmaceuticals, Inc., Cambridge, Mass.

Continuation-in-part of application No. 08/918,401, Aug. 26, 1997, abandoned. This application Aug. 27, 1997, Appl. No. 920,610.

Int. Cl.[7] C12N *1/15;1/21;5/10;15/62*

U.S. Cl. 435—366 **44 Claims**

1. A nucleic acid encoding a chimeric transcription activator protein which

(a) includes at least one composite transcription activation domain comprising three or more transcriptional activation tags which are mutually heterologous and do not occur in nature in the same gene product, wherein each transcriptional activation tag, alone or together with another transcriptional activation tag, activates transcription in a cell of a gene to which the chimeric transcription activator protein binds;

(b) includes at least one additional domain comprising a DNA-binding domain; and

(c) activates transcription of a gene to which the chimeric transcription activator protein binds.

6,015,710

MODULATION OF MAMMALIAN TELOMERASE BY PEPTIDE NUCLEIC ACIDS

Jerry W. Shay, Dallas; Woodring E. Wright, Arlington, both of Tex.; Mieczyslaw A. Piatyszek, San Jose, Calif.; David R. Corey, and James C. Norton, both of Dallas, Tex., assignors to The University of Texas System, Austin, Tex.

Filed Apr. 9, 1996, Appl. No. 630,019

Int. Cl.[7] C12N *5/16;* **A61K** *38/08;38/16;* **C07H** *21/00*

U.S. Cl. 435—375 **8 Claims**

5. A method for modulating mammalian telomerase activity in a cell, the method comprising the step of administering to a mammalian cell in vitro, under conditions where telomerase activity is modulated, a peptide nucleic acid polymer wherein the nucleobase sequence of the peptide nucleic acid polymer is selected from the group consisting of:

NH2—TAGGGTTAG—COOH (SEQ ID NO:20);

NH2—TTAGGGTTAG—COOH (SEQ ID NO:8);

NH2—GTTAGGGTTAG—COOH (SEQ ID NO:9);

NH2—AGTTAGGGTTAG—COOH (SEQ ID NO:10);

NH2—CAGTTAGGGTTAG—COOH (SEQ ID NO:11);

NH2—CTCAGTTAGGGTTAG—COOH (SEQ ID NO: 12);

NH2—CCCTTCTCAGTTAGGGTTAG—COOH (SEQ ID NO: 13);

NH2—TAGGGTTAGAC—COOH (SEQ ID NO: 14);

NH2—GTTAGGGTTAGAC—COOH (SEQ NO:15);

NH2—GGGTTAGACAA—COOH (SEQ D NO:16);

NH2—TAGGGTTAGACAA—COOH (SEQ ID NO:17);

NH2—GTTAGGGTTAGACAA—COOH (SEQ ID NO:18),

and these nucleobase sequences wherein the nucleobase thymine is replaced by the nucleobase uridine, at some or all occurrences of T.

6,015,711

SMOOTH MUSCLE 22α PROMOTER, GENE TRANSFER VECTORS CONTAINING THE SAME, AND METHOD OF USE OF THE SAME TO TARGET GENE EXPRESSION IN ARTERIAL SMOOTH MUSCLE CELLS

Eric N. Olson; Li Li, both of Dallas, Tex., and Joseph M. Miano, Milwaukee, Wis., assignors to The Board of Regents of the University of Texas System, Austin, Tex.

Continuation of application No. 08/555,723, Nov. 14, 1995, Pat. No. 5,837,534. This application Jul. 28, 1998, Appl. No. 123,465.

Int. Cl.[7] A61K *48/00*

U.S. Cl. 435—375 **6 Claims**

1. A method for expression of foreign DNA in mammalian arterial smooth muscle cell, comprising: introducing into mammalian arterial smooth muscle cells a gene transfer vector comprising a mouse SM22α promoter operably linked to foreign DNA encoding a desired polypeptide or RNA, wherein said foreign DNA is expressed, and wherein said promoter is selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5 and SEQ ID NO:6.

6,015,712

ANTISENSE MODULATION OF FADD EXPRESSION

Brett P. Monia, La Costa; Brenda F. Baker, Carlsbad; Hong Zhang, Carlsbad, and Lex M. Cowsert, Carlsbad, all of Calif., assignors to Isis Pharmaceuticals Inc., Carlsbad, Calif.

Filed Jul. 19, 1999, Appl. No. 357,072

Int. Cl.[7] C07H *21/04;* **C12Q** *1/68;* **C12N** *15/00*

U.S. Cl. 435—375 **24 Claims**

1. An antisense compound 8 to 30 nucleobases in length targeted to the 3'UTR of a nucleic acid molecule encoding human FADD, wherein said antisense compound specifically hybridizes with and inhibits the expression of human FADD.

6,015,713

TRANSGENIC FISH AND A METHOD OF HARVESTING ISLET CELLS THEREFROM

James R. Wright, Jr., Halifax, and Bill Pohajdak, Dartmouth, both of Canada, assignors to Dalhousie University, Nova Scotia, Canada

PCT No. PCT/CA96/00171, § 371 Date Dec. 6, 1996, § 102(e) Date Dec. 6, 1996, PCT Pub. No. WO96/32087, PCT Pub. Date Oct. 17, 1996

PCT Filed Mar. 22, 1996, Appl. No. 750,391

Claims priority, application U.S., Apr. 6, 1995, 08/417866

Int. Cl.[7] C12N *15/00;5/00;* A01K *67/00*

U.S. Cl. 435—378 2 Claims

1. A method for harvesting principal islets from fish, said method comprising:

a) incubating islet-containing tissue obtained from fish, wherein said islet-containing tissue comprises adipose tissue and connective tissue, with collagenase type II for a period of time sufficient to release the islets from adipose and connective tissue; and

b) separating the released islets from said adipose and connective tissue.

6,015,714

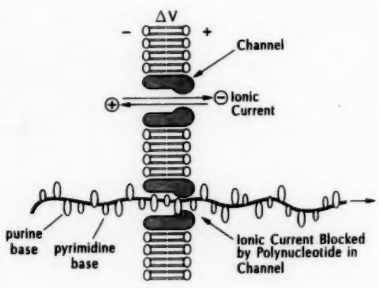
CHARACTERIZATION OF INDIVIDUAL POLYMER MOLECULES BASED ON MONOMER-INTERFACE INTERACTIONS

Richard Baldarelli, Bar Harbor, Me.; Daniel Branton, Lexington; George Church, Brookline, both of Mass.; David W. Deamer; Mark Akeson, both of Santa Cruz, Calif., and John Kasianowicz, Darnestown, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C., and The Regents of the University of California, Oakland, Calif.

Continuation-in-part of application No. 08/405,735, Mar. 17, 1995, Pat. No. 5,795,782. This application Jun. 16, 1998, Appl. No. 98,142.

Int. Cl.[7] G01N *33/483*

U.S. Cl. 436—2 24 Claims



1. A method for sequencing a nucleic acid polymer, the method comprising:

providing two separate, adjacent pools of a medium and an interface between the two pools, the interface having a channel so dimensioned as to allow sequential monomer-by-monomer passage from one pool to the other pool of only one nucleic acid polymer at a time;

placing the nucleic acid polymer to be sequenced in one of the two pools; and

taking measurements as each of the nucleotide monomers of the nucleic acid polymer passes through the channel so as to sequence the nucleic acid polymer.

6,015,715

METHOD OF MANUFACTURING A SENSITIVE SINGLE-LAYER SYSTEM FOR MEASURING THE CONCENTRATION OF ANALYTES, AND A SYSTEM PRODUCED BY THIS METHOD

Uwe Kirschner, Alttrachau 41, Dresden 01139, Germany; Matthias Lau, Blasewitzer Strasse 22, Dresden 01307, Germany; Birgit Hannemann, Augsburger Strasse 44, Chemnitz 09126, Germany, and Adriana Tamachkiarowa, 17 Januari, Sliven 8800, Bulgaria

PCT No. PCT/DE96/00915, § 371 Date Jan. 6, 1998, § 102(e) Date Jan. 6, 1998, PCT Pub. No. WO96/37768, PCT Pub. Date Nov. 28, 1996

PCT Filed May 24, 1996, Appl. No. 952,506

Claims priority, application Germany, May 27, 1995, 195 19 496

Int. Cl.[7] G01N *21/64;33/48*

U.S. Cl. 436—166 31 Claims

1. Method of manufacturing a single-layer system for measuring concentration of analytes, comprising:

adsorbing fluorescence indicator on filler material forming fluorescence indicator adsorbed filler material;

mixing the fluorescence indicator adsorbed filler material with a permeable matrix material forming a mixture;

applying the mixture under a pressure of 12 to 20×10^4 Pa onto a substrate to obtain a sensitive layer having a thickness and shape;

polymerizing, polycondensing or hardening the matrix material; and

homogenizing the layer by swelling with a solvent capable of dissolving the fluorescence indicator.

6,015,716

DETECTION OF ENDOTOXIN LEVELS IN LIPOSOMES, LIPID BILAYERS AND LIPID COMPLEXES

Paul A. Harmon, Newtown, Pa.; Donna J. Cabral-Lilly, Lawrenceville; J. Craig Franklin, Skillman, both of N.J.; Robert A. Reed, North Wales, and Andrew S. Janoff, Yardley, both of Pa., assignors to The Liposome Company, Inc., Princeton, N.J.

Filed Jul. 12, 1996, Appl. No. 679,046

Int. Cl.[7] A61K *9/50;* G01N *31/00;* C07F *9/02*

U.S. Cl. 436—501 20 Claims

1. A method of detecting endotoxin in lipid complexes, lipid bilayers or liposomes, the method comprising the steps of:

(a) preparing an aqueous suspension of micelles from an aqueous suspension of lipid bilayers, liposomes or lipid complexes comprising a lipid by completely solubilizing the lipid bilayer, liposome or lipid complex suspension with a detergent so as to form micelles comprising the lipid and the detergent;

(b) assaying the micellar suspension for the presence of endotoxin, wherein, the detergent does not inhibit the endotoxin assay by a factor of more than about 100 and wherein the endotoxin assay is effective to detect endotoxin in the micellar suspension at an endotoxin concentration as low as about 0.1 EU/ml.

6,015,717

METHOD FOR MONITORING RAPID THERMAL PROCESS INTEGRITY

Nicholas Harris Tripsas, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 13, 1998, Appl. No. 42,331

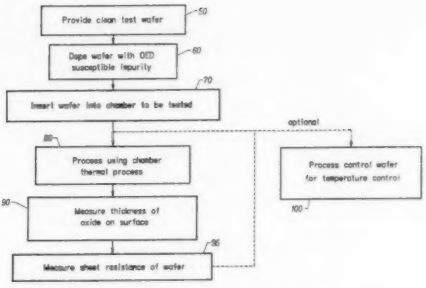
Int. Cl.[7] G01R *31/26;* H01L *21/66*

U.S. Cl. 438—16 18 Claims

1. A method of monitoring a rapid thermal process wherein said process in sensitive to leaks, comprising:

(a) providing a test wafer having a first conductivity type;

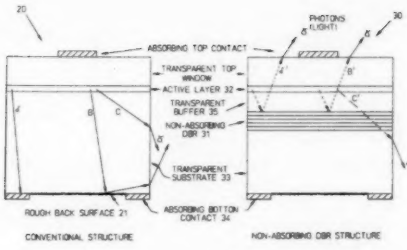
(b) doping the wafer with a dopant of an opposite conductivity type;



(c) annealing the wafer in an inert ambient;

(d) measuring the oxide thickness of the wafer; and

(e) measuring the sheet resistance of the wafer.



absorption less than 25% that strikes it within a second range of angles of incidence greater than 25 degrees from normal; and

placing the first distributed Bragg reflector in the light emitting diode with the transparent substrate.

6,015,718

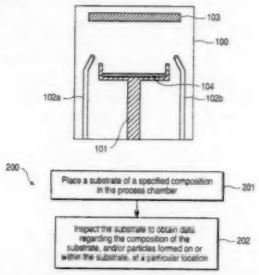
INDENTIFICATION OF THE COMPOSITION OF PARTICLES IN A PROCESS CHAMBER

Richard A. Rathbone, Austin, Tex., assignor to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Aug. 14, 1997, Appl. No. 911,471

Int. Cl.[7] **H01L** *21/66;* **G01R** *31/26*

U.S. Cl. 438—17 **16 Claims**


103
100
104
102a
102b
101
200
Place a substrate of a specified composition in the process chamber
201
Inspect the substrate to obtain data regarding the composition of the substrate, and/or particles formed on or within the substrate, at a particular location
202

1. A method for enabling identification of the composition of a particle in a process chamber, comprising the steps of:

placing a test substrate in the process chamber, wherein each of the elements that substantially comprise the composition of the test substrate are different than each of the elements that substantially comprise the composition or compositions of a process substrate or substrates; and

inspecting the test substrate, wherein the inspection of the test substrate produces data regarding the composition of the test substrate and/or particles formed on or within the test substrate at a particular location on or within the test substrate.

6,015,719

TRANSPARENT SUBSTRATE LIGHT EMITTING DIODES WITH DIRECTED LIGHT OUTPUT

Fred A. Kish, Jr., and Stephen A. Stockman, both of San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of application No. 08/962,944, Oct. 24, 1997, Pat. No. 5,793,062. This application Apr. 24, 1998, Appl. No. 66,089.

Int. Cl.[7] **H01L** *21/00*

U.S. Cl. 438—29 **6 Claims**

1. A method for fabricating a light emitting diode with a transparent substrate comprising the steps of:

fabricating at least a first distributed Bragg reflector reflecting light that strikes it within a first range of angles of incidence less than 25 degrees from normal and transmitting light with

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6,015,720

METHOD OF FORMING POLYCRYSTALLINE SEMICONDUCTOR THIN FILM

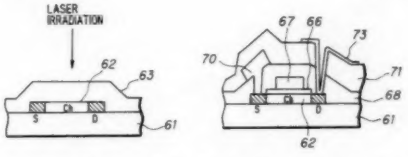
Masahiro Minegishi; Masumitsu Ino; Masafumi Kunii; Takenobu Urazono, and Hisao Hayashi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 18, 1995, Appl. No. 544,569

Claims priority, application Japan, Oct. 19, 1994, 6-280097

Int. Cl.[7] **H11L** *21/268*

U.S. Cl. 438—30 **5 Claims**



1. A method of making a thin film semiconductor device, comprising the steps of:

providing an insulating substrate comprising a glass material having a maximum processing temperature of a 600° C. having a surface;

growing a precursory polycrystalline semiconductor layer substantially free of hydrogen and comprising clusters of microscopic polycrystalline silicon crystal grains having a grain diameter of greater than 3 nm on the surface by low pressure or atmospheric pressure chemical vapor deposition at a temperature of from about 500 to 600° C. using 100% SiH_4 as a gaseous raw material;

implanting impurities into device regions of the precursory polycrystalline semiconductor layer to form source and drain regions in each said device regions;

forming an anti-reflective film on the implanted precursory polycrystalline semiconductor layer at a temperature below the maximum processing temperature of the insulating substrate;

irradiating the precursory polycrystalline semiconductor layer in a single shot with an excimer pulse laser having a rectangular shaped beam having a cross-sectional intensity distribution such that beam intensity in peripheral regions of the beam is higher than beam intensity in a central region of the beam by about 1 to about 70% and having an energy density of from about 150 to about 500 mJ/cm^2 and a pulse duration time of from about 10 to about 1000 nanoseconds such that a substrate temperature of from about 20 to about 450° C. is maintained to recrystallize the precursory layer to provide a polycrystalline semiconductor thin film having a crystal grain size of great than or equal to about 467 nm and to activate implanted impurities;

removing the anti-reflective film;

forming a gate insulating film in each device region in a channel region defined between source and drain regions; and

thereafter, forming an aluminum gate electrode on the gate insulating film to provide said thin film semiconductor device.

6,015,721

METHOD OF MANUFACTURING AN AVALANCHE PHOTODIODE

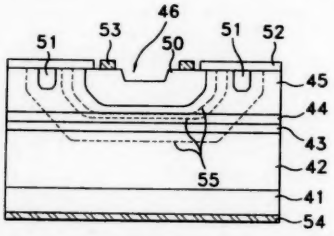
Don-Soo Kim, Ich'on, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Dec. 23, 1997, Appl. No. 997,422

Claims priority, application Rep. of Korea, Dec. 30, 1996, 96-77717

Int. Cl.[7] H01L *21/00*

U.S. Cl. 438—91 **20 Claims**



1. A method of manufacturing an avalanche photodiode comprising the steps of:

forming an absorption layer, a grading layer, a charge sheet layer of a first conductivity type and a multiplying layer in sequence on compound semiconductor substrate of the first conductivity type;

forming a concave portion within the multiplying layer at the central portion thereof;

forming a first diffusion layer of a second conductivity type to a first depth within the multiplying layer so as to surround the concave portion; and

forming a second diffusion layer of the second conductivity type within the multiplying layer to a second depth deeper than the first depth by extending the first diffusion layer and simultaneously with forming a floating guard-ring within the multiplying layer, separated from the second diffusion with a selected distance, whereby a junction face between the second diffusion layer and the multiplying layer is formed with a gentle grade at the edge portion of the junction face.

6,015,722

METHOD FOR ASSEMBLING AN INTEGRATED CIRCUIT CHIP PACKAGE HAVING AN UNDERFILL MATERIAL BETWEEN A CHIP AND A SUBSTRATE

Donald R. Banks; Ronald G. Pofahl; Mark F. Sylvester, all of Eau Claire; William G. Petefish, Chippewa Falls, and Paul J. Fischer, Eau Claire, all of Wis., assignors to Gore Enterprise Holdings, Inc., Newark, Del.

Continuation of application No. 09/252,722, Feb. 19, 1999, Pat. No. 5,970,319, which is a continuation of application No. 09/166,056, Oct. 2, 1998, Pat. No. 5,919,329, Provisional application No. 60/061,821, Oct. 14, 1997. This application Aug. 6, 1999, Appl. No. 369,800.

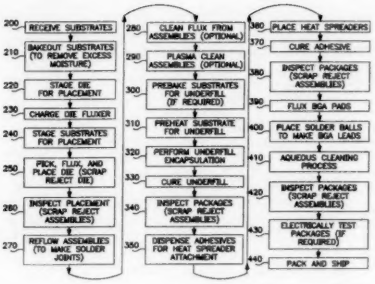
Int. Cl.[7] H01L *21/58;21/60*

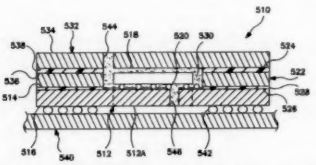
U.S. Cl. 438—108 **2 Claims**

1. A method for assembling an integrated circuit chip package having an organic package substrate and an integrated circuit chip, said method comprising the following steps:

providing an organic package substrate having,

A) a metal core having at least one clearance formed therethrough,


200 RECEIVE SUBSTRATES
210 BAKEOUT SUBSTRATES (TO REMOVE EXCESS MOISTURE)
220 STAGE DIE FOR PLACEMENT
230 CHARGE DIE FLUXER
240 STAGE SUBSTRATES FOR PLACEMENT
250 PICK, FLUX, AND PLACE DIE (SCRAP REJECT DIE)
260 INSPECT PLACEMENT (SCRAP REJECT ASSEMBLIES)
270 REFLOW ASSEMBLIES (TO MAKE SOLDER JOINTS)
280 CLEAN FLUX FROM ASSEMBLIES (OPTIONAL)
290 PLASMA CLEAN ASSEMBLIES (OPTIONAL)
300 PREBAKE SUBSTRATES FOR UNDERFILL (IF REQUIRED)
310 PREHEAT SUBSTRATE FOR UNDERFILL
320 PERFORM UNDERFILL ENCAPSULATION
330 CURE UNDERFILL
340 INSPECT PACKAGES (SCRAP REJECT ASSEMBLIES)
350 DISPENSE ADHESIVES FOR HEAT SPREADER ATTACHMENT
360 PLACE HEAT SPREADERS
370 CURE ADHESIVE
380 INSPECT PACKAGES (SCRAP REJECT ASSEMBLIES)
390 FLUX BGA PADS
400 PLACE SOLDER BALLS TO MAKE BGA LEADS
410 AQUEOUS CLEANING PROCESS
420 INSPECT PACKAGES (SCRAP REJECT ASSEMBLIES)
430 ELECTRICALLY TEST PACKAGES (IF REQUIRED)
440 PACK AND SHIP



B) at least one dielectric layer disposed on each of top and bottom surfaces of said metal core, said at least one dielectric layer being a polytetrafluoroethylene material having a mixture disposed within said material, said mixture containing particulate filler,

C) at least one conductive layer disposed on each of said dielectric layers and at least one conductive via electrically connecting said conductive layers, and

D) a plurality of interconnect pads adapted to electrically and mechanically mount an integrated circuit chip;

providing an integrated circuit chip having disposed on a surface thereof a plurality of solder interconnect members;

locating the integrated circuit chip on said organic package substrate in an orientation wherein each of said solder interconnect members of said integrated circuit chip are aligned with an individual interconnect pad of said organic package substrate;

heating the organic package substrate and the integrated circuit chip to a temperature of less than 260° C. to thereby mechanically and electrically attach the integrated circuit chip to the organic package substrate;

cleaning said integrated circuit chip and said organic package substrate with a solvent liquid;

plasma cleaning said integrated circuit chip and said organic package substrate;

heating said integrated circuit chip and said organic package substrate to a temperature ranging from about 70° C. to about 90° C.;

providing an underfill bonding material having an elastic modulus less than about 10 Gpa, a Poisson's Ratio less than about 0.29, a coefficient of thermal expansion of less than about 32 ppm/°C., and a linear cure shrinkage of less than about 0.2%;

disposing said underfill bonding material between said integrated circuit chip and said organic package substrate; and

curing said underfill bonding material.

6,015,723

LEAD FRAME BONDING DISTRIBUTION METHODS

Chi-Young Choi, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

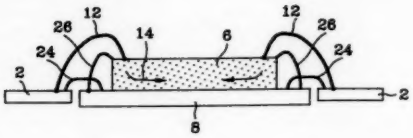
Division of application No. 08/696,399, Aug. 14, 1996, Pat. No. 5,898,225. This application Feb. 16, 1999, Appl. No. 250,430.

Claims priority, application Rep. of Korea, Aug. 14, 1995, 95-25004

Int. Cl.[7] H01L *21/44*

U.S. Cl. 438—123 **9 Claims**

1. A method of distributing power to an integrated circuit package including an integrated circuit chip having first and second



opposing faces, a plurality of pads on the first face of the integrated circuit chip, a plurality of external pins, and a plurality of wires, a respective one of which directly electrically connects a respective external pin to a respective pad, said method comprising the steps of:

electrically contacting a conductive lead frame to the second face of the integrated circuit chip; and

bonding a selected one of the external pins which is connected to a selected one of the wires to the conductive lead frame to thereby electrically connect the second face of the integrated circuit chip to the selected one of the external pins via the conductive lead frame.

6,015,724

MANUFACTURING METHOD OF A SEMICONDUCTOR DEVICE

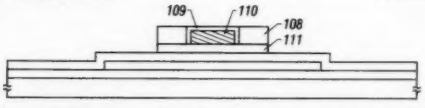
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Kanagawa-ken, Japan

Filed Nov. 4, 1996, Appl. No. 743,169

Claims priority, application Japan, Nov. 2, 1995, 7-310075

Int. Cl.[7] H01L *21/00*

U.S. Cl. 438—151 **2 Claims**



1. A manufacturing method of a semiconductor device comprising the steps of:

forming an anodic oxide film on a gate electrode comprising aluminum;

forming an interlayer insulating film over said anodic oxide film and said gate electrode;

forming an opening in said interlayer insulating film to expose a portion of said anodic oxide film;

removing the exposed portion of said anodic oxide film by a chromic mixture acid to deepen said opening toward said anodic oxide film and to allow a passive state film of said aluminum to be formed on a surface of a portion of said gate electrode under said opening; and

removing said passive state film using a hydrofluoric acid to form a contact hole extending from said opening to said surface portion of said gate electrode and to terminate said surface of said portion of said gate electrode by a fluorine atom.

6,015,725

VERTICAL FIELD EFFECT TRANSISTOR AND MANUFACTURING METHOD THEREOF

Teruo Hirayama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 19, 1997, Appl. No. 914,096

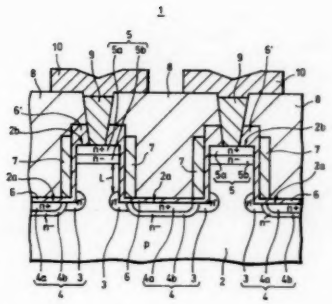
Claims priority, application Japan, Aug. 22, 1996, 8-221436

Int. Cl.[7] H01L *21/8232*

U.S. Cl. 438—156 **3 Claims**

1. A method of manufacturing a vertical field effect transistor, comprising in the following order the steps of:

forming separate buried layers of a second conduction type by ion implantation to a predetermined depth in a semiconductor substrate of a first conduction type;



forming a recess for each buried layer, each recess having a width smaller than the width of said buried layer and having the bottom thereof located within said buried layer of said semiconductor substrate and with adjacent recesses being separated by a protrusion;

forming a gate insulation film on the side walls of the protrusion;

forming a gate electrode on the gate insulating film on the side wall of the protrusion;

forming an impurity region making up a source and a drain on the surface of said protrusion and on the bottom surface of said recess;

providing an insulating layer to cover the protrusions and fill the recesses;

forming an opening in the insulating layer above each protrusion; and

forming a plug contact in the opening contacting the upper surface of each protrusion.

3. A method according to claim **1**, wherein the step of forming separate buried layers includes forming an insulating film layer on the semiconductor material before ion implantation and then forming a first mask on the insulating film layer for the ion implantation, and wherein the step of forming a recess includes etching portions of the insulating film layer using the first mask to form remaining portions, then removing the first mask, covering the remaining portions of the insulating film layer with an insulating oxide film, etching the insulating oxide film to form side wall films on the remaining portions and then using the remaining portions with the side wall films as a second mask when forming the recesses.

6,015,726

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME

Hiroshi Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 24, 1998, Appl. No. 46,535

Claims priority, application Japan, Mar. 24, 1997, 9-069886

Int. Cl.[7] H01L *21/8238*

U.S. Cl. 438—202 **20 Claims**

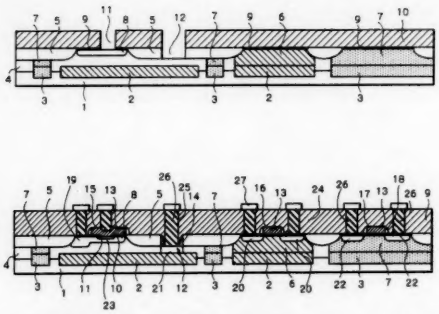
18. A method of producing a semiconductor device having a bipolar transistor and a CMOS transistor, which includes a PMOS transistor and an NMOS transistor, on a single semiconductor substrate, said method comprising the steps of:

(a) forming buried and epitaxial layers on the semiconductor substrate;

(b) forming a field oxide layer between a bipolar transistor region and a CMOS transistor region and within the CMOS transistor region between a PMOS transistor region and a NMOS transistor region;

(c) forming a gate oxide layer on top of the transistor regions;

(d) etching the gate oxide layer to form an emitter contact hole through the gate oxide layer above the bipolar transistor region and the field oxide layer to form a collector contact hole through the field oxide layer between the bipolar transis-



tor region and the CMOS transistor region, the collector contact hole extending to the epitaxial layer;

(e) forming a polysilicon layer on top of the gate oxide layer remaining after the step (c) of etching and within the emitter and collector contact holes; and

(f) etching the polysilicon to form an emitter electrode on top of the bipolar transistor region and gate electrodes on top of each of the PMOS and NMOS transistor regions.

6,015,727

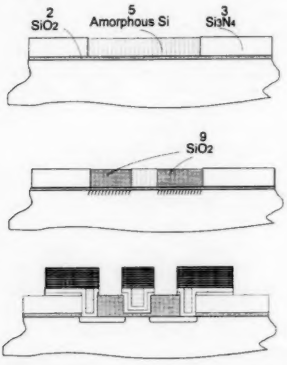
DAMASCENE FORMATION OF BORDERLESS CONTACT MOS TRANSISTORS

Frank M. Wanlass, 2655 Keystone Ave., Apt. 4, Santa Clara, Calif. 95051

Filed Jun. 8, 1998, Appl. No. 93,221

Int. Cl.[7] H01L *21/8238*

U.S. Cl. 438—218 **20 Claims**



1. A method of making a semiconductor device comprising:

providing a substrate;

forming a first dielectric layer over said substrate;

etching one or more openings in said first dielectric layer, wherein said openings define the location of MOS transistors;

depositing a material layer over said substrate to fill said openings;

pattering said material layer to define source and drain regions adjacent to a remaining portion of said material layer;

doping said source and drain regions with dopants;

depositing a second dielectric layer over said source and drain regions;

removing said remaining portion of said material layer to define a channel region in said substrate said channel region disposed between said source and drain regions;

depositing a third dielectric layer over said channel region to form a gate insulating layer;

etching contact openings over said source and drain regions;

forming contacts over said gate insulating layer and in said contact openings.

6,015,728

METHOD FOR FABRICATING SRAM POLYLOAD RESISTOR

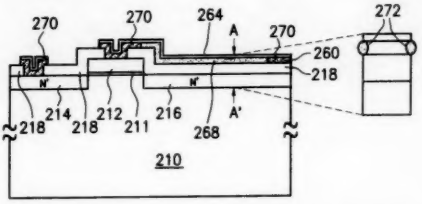
Kuo-Yu Chou, Hsinchu, Taiwan, assignor to Winbond Electronics Corp., Taiwan

Filed Apr. 6, 1998, Appl. No. 55,580

Claims priority, application Taiwan, Jan. 17, 1998, 87100591

Int. Cl.[7] H01L *21/8244*

U.S. Cl. 438—238 **32 Claims**



1. A method for fabricating static random access memory polyload resistor comprising:

providing a semiconductor substrate having a transistor formed thereon, wherein the transistor includes a gate terminal, a source region and a drain region;

forming a dielectric layer over the substrate;

removing a portion of the dielectric layer using photolithographic and etching operations to form a plurality of vias;

forming a polysilicon layer over the substrate;

patterning the polysilicon layer using photolithographic and etching operations, and then doping ions into the exposed polysilicon layer to form a doped polysilicon layer;

forming an anti-oxidation layer over the substrate;

removing a portion of the polysilicon layer and a portion of the anti-oxidation layer using photolithographic and etching operations to form an interconnect region and a load resistor region;

performing a thermal oxidation; and

removing the anti-oxidation layer.

6,015,729

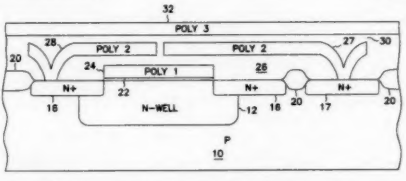
INTEGRATED CHIP MULTILAYER DECOUPLING CAPCITORS

Brian M. Shirley; Stephen L. Casper; Tyler A. Lowrey, and Kevin G. Duesman, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of application No. 08/539,855, Oct. 6, 1995, Pat. No. 5,739,576. This application Aug. 28, 1997, Appl. No. 919,849.

Int. Cl.[7] H01G *4/10;* **H01L** *29/68*

U.S. Cl. 438—239 **8 Claims**



1. A method for forming a multiple multilayer capacitor structure comprising at least three series connected capacitors on a semiconductor substrate, comprising the steps of:

a) forming a first conductive well structure in the substrate;

b) forming a first insulating layer over at least a portion of the conductive well structure;

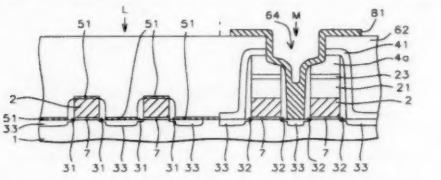
c) forming a first thin film conductive layer structure over the first insulating layer;
d) forming a second insulating layer over at least a portion of the first thin film layer;
e) forming a second thin film conductive layer structure over the second insulating layer;
f) bifurcating the second thin film conductive layer structure to form at least two conductive layers which are coplanar in the region above the first thin film layer;
g) coupling a first one of the two layers which are coplanar in the region above the first thin film layer to a source of reference potential in the substrate, and a second one of the two conductive layers which are coplanar in the region above the first thin film layer to a conductive region in the substrate constructed and arranged for connection to circuitry external to the multilayer structure such that the second and third thin film conductive layers provide a pair of series connected capacitors,
h) forming a third insulating layer over at least a portion of the second thin film layer; and
i) forming a third thin film conductive layer structure over the third insulating layer such that each of said adjacent conductive structures is separated by an insulating layer.

6,015,730

INTEGRATION OF SAC AND SALICIDE PROCESSES BY COMBINING HARD MASK AND POLY DEFINITION

Chen-Jong Wang; Jenn Ming Huang, and Chue San Yoo, all of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Mar. 5, 1998, Appl. No. 34,926
Int. Cl.[7] H01L *21/8242;21/3205;21/4763*
U.S. Cl. 438—241 **15 Claims**



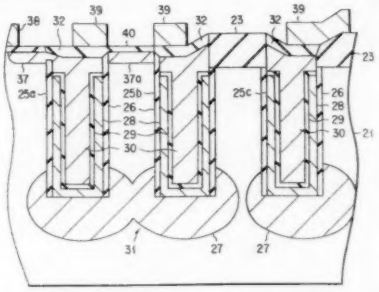
1. A method of combining hard mask and poly definition when forming contacts in an integrated circuit wafer that contains logic and memory areas, comprising the sequential steps of:
providing a P type silicon wafer having a top surface;
forming a layer of gate oxide on said surface;
depositing on the wafer successive layers of first polysilicon and first silicon oxide;
selectively removing said first silicon oxide layer from the memory area;
depositing on the wafer successive layers of tungsten silicide, second silicon oxide, and silicon nitride;
selectively removing the silicon nitride, second silicon oxide, tungsten silicide, and first oxide layers from the logic area;
in the memory area only, patterning and etching the silicon nitride, second oxide, tungsten silicide, first polysilicon, and gate oxide layers to form memory gate pedestals having vertical walls;
in the logic area only, patterning and etching the first polysilicon and gate oxide layers to form logic gate pedestals having vertical walls;
forming N type source and drain regions adjacent to said vertical walls by means of ion implantation into said adjacent regions together with the formation of silicon nitride spacers on said vertical walls; selectively depositing a layer of resist protecting oxide on the memory area;
depositing a layer of a silicide forming metal on the wafer;
subjecting the wafer to a first rapid thermal anneal whereby the metal reacts to form a layer of silicide wherever it is in direct contact with silicon;
removing all unreacted metal thereby forming self-aligned source, gate, and drain contacts in the logic area;
subjecting the wafer to a second rapid thermal anneal;
depositing a layer of inter poly oxide over the wafer sufficient to fully cover both the logic and the memory area;
patterning and etching the inter poly oxide to form contact holes in the memory area;
depositing a second polysilicon layer; and
patterning and etching the second polysilicon layer to form connections in said contact holes.

6,015,731

METHOD OF MANUFACTURING A SEMICONDUCTOR MEMORY DEVICE

Yusuke Kohyama, Yokosuka, and Akira Sudo, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki-ishi, Japan

Continuation of application No. 08/606,407, Feb. 23, 1996, abandoned, which is a division of application No. 08/334,396, Nov. 3, 1994, Pat. No. 5,521,407. This application Sep. 4, 1997, Appl. No. 923,735.
Claims priority, application Japan, Nov. 8, 1993, 5-278149
Int. Cl.[7] H01L *21/8242*
U.S. Cl. 438—243 **15 Claims**



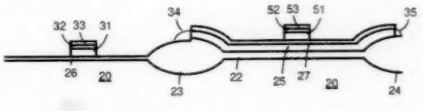
1. A method of manufacturing a semiconductor memory device, comprising the steps of:
forming a first element separation oxide film having a structure consisting of a plurality of parallel lines spaced apart from each other, on a surface of a semiconductor substrate; and
forming trenches on a first portion of said semiconductor substrate situated between a pair of lines of said first element separation oxide film, both side regions of said trenches used for a capacitor of said semiconductor memory device formed therein and being in contact with said first element separation oxide film.

6,015,732

DUAL GATE OXIDE PROCESS WITH INCREASED RELIABILITY

Jon Roderick Williamson, and Subhash R. Nariani, both of San Jose, Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 6, 1996, Appl. No. 709,479
Int. Cl.[7] H01L *21/8242*
U.S. Cl. 438—253 **14 Claims**



1. A method comprising the following steps:
(a) forming gate oxide within regions on a substrate;

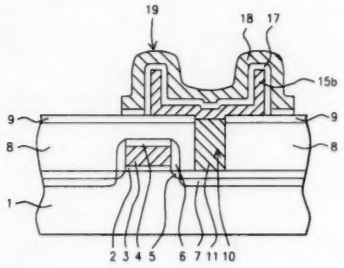
(b) forming polysilicon over a first region, the polysilicon extending over field oxide surrounding the first region;
(c) thinning gate oxide within a second region, the polysilicon over the first region preventing gate oxide within the first region from being thinned;
(d) forming a first transistor gate within the second region, including the following substeps:
(d.1) depositing a layer of polysilicon,
(d.2) depositing a layer of metal-silicide,
(d.3) depositing a dielectric layer, and
(d.4) etching the dielectric layer, the layer of metal-silicide and the layer of polysilicon to form the first transistor gate; and,
(e) after forming the first transistor gate within the second region, etching the polysilicon which is over the first region to form a second transistor gate.

6,015,733

PROCESS TO FORM A CROWN CAPACITOR STRUCTURE FOR A DYNAMIC RANDOM ACCESS MEMORY CELL

Yu-Hua Lee, Hsinchu, and James (Cheng-Ming) Wu, Kao-Hsiung, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Aug. 13, 1998, Appl. No. 133,356
Int. Cl.[7] H01L *21/8242*
U.S. Cl. 438—253 **22 Claims**



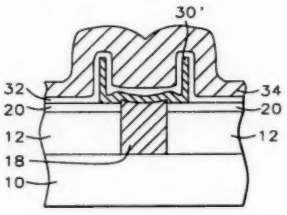
1. A method of creating a capacitor structure, for dynamic random access memory (DRAM) devices, on a semiconductor substrate, comprising the steps of:
providing a transfer gate transistor, on said semiconductor substrate, comprised of a polysilicon gate structure, on a gate insulator layer, with a source/drain region, in a region of said semiconductor substrate, not covered by said polysilicon gate structure;
forming a storage node contact hole, in a composite insulator layer, exposing a source region, of said source/drain region;
forming a doped polysilicon plug, in said storage node contact hole, contacting said source region;
depositing a thick insulator layer;
forming an opening in said thick insulator layer, exposing the top surface of said doped polysilicon plug;
depositing a polysilicon layer, on the top surface of said thick insulator layer, on the surfaces of said thick insulator, exposed in said opening, and on the top surface of said doped polysilicon plug, exposed in the bottom of said opening, in said thick insulator layer;
forming a photoresist plug, in said opening, in said thick insulator layer, covering the portion of said polysilicon layer residing on the sides of, and on the bottom of, said opening, in said thick insulator layer;
removing the portion of said polysilicon layer, residing on the top surface of said thick insulator layer, creating a crown shaped, polysilicon layer, covered by said photoresist plug, in said opening, in said thick insulator layer;
removing said photoresist plug;
removing said thick insulator layer;
forming a capacitor dielectric layer on said crown shaped, polysilicon storage node structure; and
forming a polysilicon upper electrode structure, on said capacitor dielectric layer.

6,015,734

METHOD FOR IMPROVING THE YIELD ON DYNAMIC RANDOM ACCESS MEMORY (DRAM) WITH CYLINDRICAL CAPACITOR STRUCTURES

Kuo Ching Huang, Kaohsiung; Yu Hua Lee, Hsinchu, and Cheng-Ming Wu, Kao-Hsiung, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Sep. 4, 1998, Appl. No. 148,561
Int. Cl.[7] H01L *21/8242*
U.S. Cl. 438—253 **20 Claims**

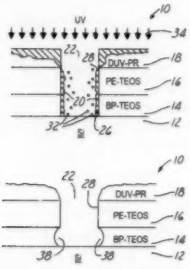


1. A method for fabricating stacked capacitors for memory devices comprising the steps of:
providing a semiconductor substrate having device areas with semiconductor devices;
forming a planar first insulating layer over said device areas on said substrate;
depositing a blanket etch-stop layer on said first insulating layer;
depositing a second insulating layer on said etch-stop layer;
selectively etching first openings for capacitor node contacts in said second insulating layer, said etch-stop layer, and said first insulating layer to said device areas;
depositing a conductively doped first polysilicon layer to fill said first openings, and etching back said first polysilicon layer to form polysilicon plugs that are recessed below the surface of said second insulating layer and above said etch-stop layer;
depositing a third insulating layer;
selectively etching second openings, over and wider than said first openings, in said third and said second insulating layers to the top surface of said etch-stop layer and to said polysilicon plugs;
depositing a conformal second polysilicon layer over and in said second openings and contacting said polysilicon plugs;
polishing back said second polysilicon layer to said third insulating layer to form bottom electrodes in said second openings;
isotropically etching said third and said second insulating layers selectively to said etch-stop layer to leave free-standing said bottom electrodes, while said polysilicon plugs that abut said etch-stop layer prevent said etching from eroding said first insulating layer when said second openings are misaligned to said first openings;
depositing an interelectrode dielectric layer on said bottom electrodes;
depositing and patterning a third polysilicon layer to form top electrodes and completing said stacked capacitors.

6,015,735
METHOD FOR FORMING A MULTI-ANCHOR DRAM CAPACITOR AND CAPACITOR FORMED

Shau-Lin Shue; Hun-Jan Tao; Chia-Shiung Tsai, and Jenn-Ming Huang, all of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Co., Ltd., Hsin-Chu, Taiwan

Filed Jan. 13, 1998, Appl. No. 6,509
Int. Cl.[7] **H01L** *21/8242;21/302*
U.S. Cl. 438—254 **20 Claims**



1. A method for forming a DRAM capacitor comprising the steps of:

providing a substrate,

depositing a layer of a doped dielectric material on said substrate,

depositing a layer of an undoped dielectric material on said doped dielectric layer,

depositing a layer of a photoresist material on said undoped dielectric layer, said photoresist layer generates an acidic reaction product when exposed to UV radiation,

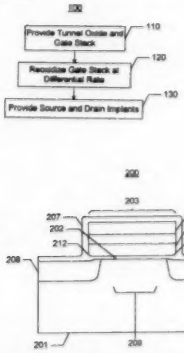
patterning said photoresist layer for a capacitor cell opening, and

etching said cell opening through said undoped and doped dielectric layers exposing said substrate by a technique that generates UV emission such that an acidic reaction product is released from said photoresist layer to selectively etching said doped dielectric layer in a lateral direction to a larger toroidal cavity than the toroidal cavity formed in said undoped dielectric layer.

6,015,736
METHOD AND SYSTEM FOR GATE STACK REOXIDATION CONTROL

Scott D. Luning, San Francisco, and Mark Randolph, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 19, 1997, Appl. No. 993,787
Int. Cl.[7] **H01L** *21/26*
U.S. Cl. 438—264 **20 Claims**



1. A method for providing at least one memory cell on a semiconductor comprising the steps of:

(a) providing a tunneling barrier on the semiconductor;

(b) providing at least one floating gate having a corner, a portion of the at least one floating gate including the corner being disposed substantially above the tunneling barrier; and

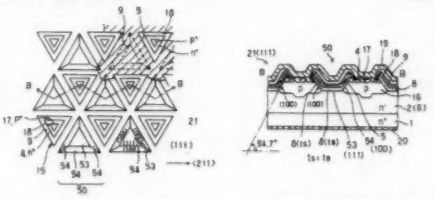
(c) oxidizing the tunneling barrier, a portion of the semiconductor adjacent the at least one floating gate, and the portion of the at least one floating gate;

wherein the portion of the semiconductor oxidizes at a first rate and at least the corner of the at least one floating gate oxidizes at a second rate, the second rate being sufficiently higher than the first rate to provide a desired thickness of the tunneling barrier a distance from the corner of the at least one floating gate for a particular rounding of the at least one floating gate.

6,015,737
PRODUCTION METHOD OF A VERTICAL TYPE MOSFET

Norihito Tokura; Shigeki Takahashi, both of Okazaki; Tsuyoshi Yamamoto, Chiryu, and Mitsuhiro Kataoka, Kariya, all of Japan, assignors to Denso Corporation, Kariya, Japan

Continuation-in-part of application No. 08/413,410, Mar. 30, 1995, Pat. No. 5,776,812, and application No. 08/030,338, filed as application No. PCT/JP92/00929, Jul. 22, 1992, Pat. No. 5,460,985. This application Aug. 15, 1995, Appl. No. 515,176. Claims priority, application Japan, Jul. 26, 1991, 3-187602; Mar. 31, 1994, 6-62448
This patent is subject to a terminal disclaimer.
Int. Cl.[7] **H01L** *21/336*
U.S. Cl. 438—270 **27 Claims**



1. A production method of a vertical type MOSFET comprising steps of:

preparing a semiconductor substrate;

forming a semiconductor layer of a first conductivity type at one main face side of said semiconductor substrate, said semiconductor layer having an impurity concentration lower than that of said semiconductor substrate and having a main surface oriented in a first crystal orientation;

local oxidizing a region of said main surface of said semiconductor layer to form a local oxide film eroding said main surface of said semiconductor layer by a depth in said region, wherein a condition of said step of local oxidizing is adjusted such that said local oxide film contacts inclined surfaces of said semiconductor layer by side surfaces thereof and all of said inclined surfaces contacting said side surfaces of said local oxide film are oriented in the same crystal orientation of a second crystal orientation;

forming channels on said respective inclined surfaces of said semiconductor layer each contacting said side surface of said local oxide film by doubly-diffusing impurities of a second conductivity type and the first conductivity type from said main surface successively in a manner of self-alignment with respect to said local oxide film, whereby a length of each of said channels is determined by the double diffusion and a base layer of the second conductivity type and a source layer of the first conductivity type are formed with respect to each of said inclined surfaces of said semiconductor layer;

removing said local oxide film after the double diffusion to form a groove structure having said depth, whereby said inclined surfaces each oriented in said second crystal orientation is exposed in an inner wall of said groove structure;

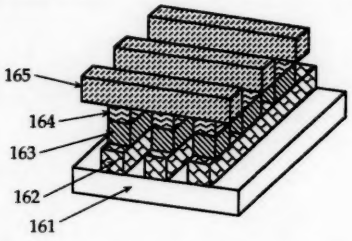
oxidizing said inner wall of said groove structure including a portion to become said channel to provide a gate oxide film;

forming a gate electrode on said gate oxide film;
forming a source electrode electrically connecting to both said source layer and said base layer; and
forming a drain electrode electrically connecting to another main face side of said semiconductor substrate.

6,015,738
METHOD FOR FABRICATING TRANSISTORLESS, MULTISTABLE CURRENT-MODE MEMORY CELLS AND MEMORY ARRAYS

Harold J. Levy, Seal Beach, and Thomas C. McGill, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of application No. 08/628,821, Apr. 5, 1996, Pat. No. 5,745,407, which is a division of application No. 08/238,390, May 5, 1994, Pat. No. 5,535,156. This application Nov. 17, 1997, Appl. No. 972,118.
Int. Cl.[7] H01L *21/8246*
U.S. Cl. 438—275 **19 Claims**



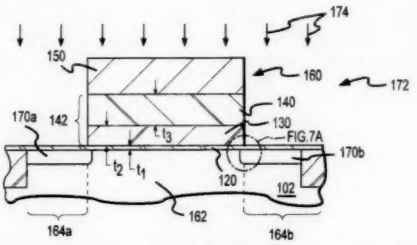
1. A method for fabricating a self-aligned, three-dimensional structure of memory cells comprising the steps of:
forming a first conducting layer;
forming a first semiconductor layer coupled to the first conducting layer;
forming a second semiconductor layer coupled to the first semiconductor layer;
patterning the second semiconductor layer;
etching the second semiconductor layer, the first semiconductor layer and the first conducting layer;
forming a second conducting layer coupled to the second semiconductor layer;
patterning and etching the second conducting layer;
etching the second semiconductor layer using the second conducting layer as a mask to form a plurality of semiconducting devices of a second kind, and etching the first semiconductor layer using the second conducting layer as a mask to form a plurality of semiconducting devices of a first kind.

6,015,739
METHOD OF MAKING GATE DIELECTRIC FOR SUB-HALF MICRON MOS TRANSISTORS INCLUDING A GRADED DIELECTRIC CONSTANT

Mark I. Gardner, Cedar Creek; H. Jim Fulford, and Dim-Lee Kwong, both of Austin, all of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Oct. 29, 1997, Appl. No. 959,796
Int. Cl.[7] H01L *21/336*
U.S. Cl. 438—287 **17 Claims**

1. A process for fabricating a gate dielectric stack of an MOS transistor, said process comprising:
forming a native oxide film on an upper surface of a semiconductor substrate;
depositing a silicon nitride layer on said native oxide film;
forming a final dielectric film on said silicon nitride film, wherein a dielectric constant of said final dielectric film is in the range of approximately 20 to 200; and

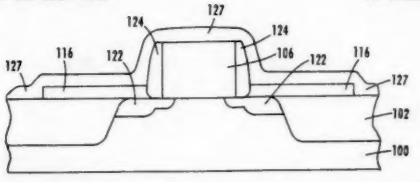


annealing said semiconductor substrate in an inert ambient, whereby said native oxide film, said silicon nitride layer, and said final dielectric film comprise said gate dielectric stack.

6,015,740
METHOD OF FABRICATING CMOS DEVICES WITH ULTRA-SHALLOW JUNCTIONS AND REDUCED DRAIN AREA

Ognjen Milic-Strkalj, Burlingame, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 10, 1997, Appl. No. 798,581
Int. Cl.[7] H01L *21/336;21/22;21/38*
U.S. Cl. 438—300 **18 Claims**

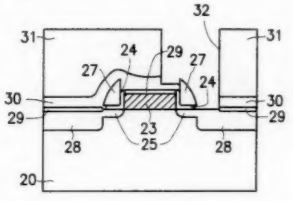


1. A method of forming a semiconductor device, comprising the steps of:
forming a gate on a substrate;
forming a consumable self-aligned diffusion source on the substrate;
siliciding the diffusion source; and
diffusing dopant material into the substrate from the diffusion source, the diffusion source becoming substantially consumed during the silicidation.

6,015,741
METHOD FOR FORMING SELF-ALIGNED CONTACT WINDOW

Tony Lin, Kaohsiung Hsien; Water Lur, and Shih-Wei Sun, both of Taipei, all of Taiwan, assignors to United Microelectronics Corp., Hsin-chu, Taiwan

Filed Apr. 13, 1998, Appl. No. 59,428
Claims priority, application Taiwan, Feb. 3, 1998, 87101265
Int. Cl.[7] H01L *21/44*
U.S. Cl. 438—305 **13 Claims**



1. A method for forming a self-aligned contact window comprising:

providing a substrate, and then forming sequentially a polysilicon layer and a first dielectric layer;

patterning the first dielectric layer and the polysilicon layer to form a gate region;

forming an oxide layer over the substrate;

implanting ions into the substrate using the gate region as a mask to form a plurality of lightly doped drain regions;

forming an insulating layer over the oxide layer;

removing the insulating layer and the oxide layer using an anisotropic etching back operation and forming spacers on the sidewalls of the gate region;

implanting ions into the substrate using the spacers and the gate region as a mask to form source/drain regions;

removing the first dielectric layer;

forming a self-aligned metal silicide over the source/drain regions and the gate region;

forming an etching stop layer over the source/drain regions and the gate region;

forming a second dielectric layer over the etching stop layer; and

patterning the second dielectric layer and the etching stop layer to form a self-aligned contact window exposing the source/drain region and the etching stop layer above the gate region.

6,015,742

METHOD FOR FABRICATING INDUCTOR OF SEMICONDUCTOR DEVICE

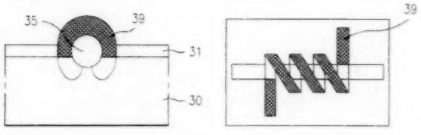
Jae Il Ju, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Apr. 2, 1998, Appl. No. 53,500

Claims priority, application Rep. of Korea, Sep. 29, 1997, 97/49794

Int. Cl.[7] **H01L** *21/20*

U.S. Cl. 438—381 **12 Claims**



1. A method for fabricating an inductor of a semiconductor device comprising the steps of:

forming impurity diffusion regions having a predetermined diffusion depth and spaced away from one another by a predetermined distance beneath surface of a semiconductor substrate;

selectively oxidizing the semiconductor substrate in a direction crossing the impurity diffusion regions to form an inductor core layer; and

forming a polysilicon layer on the entire surface including the inductor core layer and selectively patterning the polysilicon layer to form a plurality of polysilicon pattern layers each connecting with one of ends of the impurity diffusion regions with an opposite end of the adjacent impurity diffusion region so as to form an inductor coil layer electronically connecting the impurity diffusion regions.

6,015,743

SEMICONDUCTOR PROCESSING METHOD OF PROVIDING A CONDUCTIVELY DOPED LAYER OF HEMISPHERICAL GRAIN POLYSILICON AND A HEMISPHERICAL GRAIN POLYSILICON LAYER PRODUCED ACCORDING TO THE METHOD

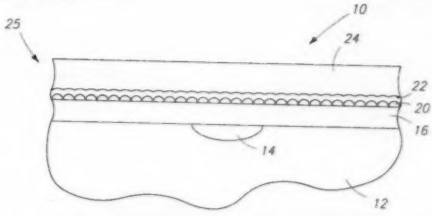
John K. Zahurak, 3757 Gekeler La. #195; Klaus F. Schuegraf, 2000 White Pine La., and Randhir P.S. Thakur, 3545 S. Bridgeport Pl., all of Boise, Id. 83706

Continuation of application No. 08/820,712, Mar. 18, 1997, which is a continuation of application No. 08/539,851, Oct. 6, 1995, Pat. No. 5,639,685. This application Apr. 22, 1998, Appl. No. 64,631.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H01L** *21/8242*

U.S. Cl. 438—398 **14 Claims**



1. A method of providing a conductively doped layer of hemispherical grain polysilicon over a substrate comprising the following steps:

depositing a layer of non-polycrystalline silicon over the substrate; and

annealing the substrate having the deposited non-polycrystalline silicon layer within a chemical vapor deposition reactor in the presence of a conductivity enhancing impurity gas under conditions effective to in situ both diffuse conductivity enhancing impurity into the layer and transform the silicon into a conductively doped hemispherical grain polysilicon layer.

6,015,744

METHOD OF MANUFACTURING A SHALLOW TRENCH ISOLATION ALIGNMENT MARK

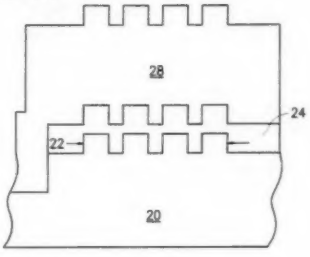
Chin-Hung Tseng, Hsinchu, Taiwan, assignor to United Silicon Incorporated, Hsinchu, Taiwan

Filed Nov. 5, 1998, Appl. No. 186,544

Claims priority, application Taiwan, Jul. 27, 1998, 8711218

Int. Cl.[7] **H01L** *21/76;21/30*

U.S. Cl. 438—401 **10 Claims**



1. A method of manufacturing shallow trench isolation alignment mark, comprising the steps of:

providing a silicon wafer that has an alignment mark already formed thereon;

forming a silicon nitride layer over the silicon wafer;

forming a plurality of shallow trenches with at least one shallow trench formed at a distance of about 2000 Å to 10000 Å from the edge of the alignment mark;

forming an oxide layer over the silicon nitride layer;

performing a chemical-mechanical polishing operation to remove a portion of the oxide layer and a portion of the silicon nitride layer so that a layer of silicon nitride layer above the alignment mark with a thickness of about 600 Å is removed from the top; and

removing the silicon nitride layer.

6,015,745

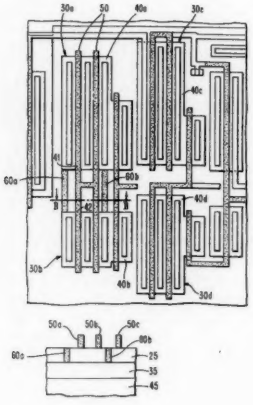
METHOD FOR SEMICONDUCTOR FABRICATION

James W. Adkisson, Jericho; Jerome B. Lasky, Essex Junction; Paul W. Pastel, Essex, and Jed H. Rankin, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1998, Appl. No. 80,754

Int. Cl.[7] H01L *21/76*

U.S. Cl. 438—405 **6 Claims**



1. A method for simplified processing of semiconductor devices having a semiconducting layer formed a top a layer of insulating semiconductor, said method comprising:

defining one or more areas capable of forming electrically active semiconductor regions on said layer of insulating semiconductor;

forming a shallow trench frame of electrically insulating material around a corresponding defined electrically active semiconductor region, each said shallow trench frame having insulating material connecting said layer of insulating semiconductor and dimensioned to electrically isolate each said electrically active semiconductor region of said semiconducting layer;

forming one or more electrically conducting layers interconnecting different electrically active components in a first frame enclosed semiconductor region and a second frame enclosed semiconductor region, each said one or more electrically conducting layers formed on said semiconducting layer extending between said first and second frame regions; and,

forming one or more shallow trenches of electrically insulating material in said semiconducting layer between said first and second frame regions, each said shallow trench having insulating material connecting said layer of insulating semiconductor and extending between said first frame and second frame to ensure electrical isolation of each said electrically conducting layers between said first and second frame regions, whereby a process for manufacturing said shallow trenches is simplified.

6,015,746

METHOD OF FABRICATING SEMICONDUCTOR DEVICE WITH A GATE-SIDE AIR-GAP STRUCTURE

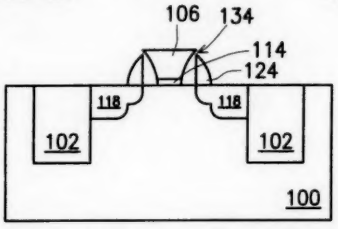
Wen-Kuan Yeh, Chupi; Tony Lin, Kaohsiung Hsien, and Heng-Sheng Huang, Taipei, all of Taiwan, assignors to United Microelectronics Corp., Taipei, Taiwan

Filed Apr. 7, 1998, Appl. No. 56,530

Claims priority, application Taiwan, Feb. 10, 1998, 87101752

Int. Cl.[7] H01L *21/3205;21/4763*

U.S. Cl. 438—421 **24 Claims**



14. A method of fabricating a semiconductor device with a gate-side air-gap structure (GAS), comprising:

providing a substrate with an isolation structure and an active region isolated by the isolation structure;

forming an oxide layer on the substrate;

forming an opening within the oxide layer to expose the active region;

forming a first spacer on a side wall of the opening;

forming a gate oxide layer on the active region exposed to the opening;

forming a conductive layer on the gate oxide layer, so that the opening is filled thereby;

removing the oxide layer;

lightly doping the exposed active region to form a lightly doped region by using the conductive layer and the first spacer as a mask;

forming a second spacer on a side wall of the first spacer, the second spacer having a height that is less than a height of the first spacer, thereby leaving a portion of the first spacer to be exposed;

heavily doping the exposed active region to form a source/drain region by using the conductive layer, the first spacer, and the second spacer as a mask; and

removing the first spacer to define a gate, so that an air gap between the gate and the second spacer is formed.

6,015,747

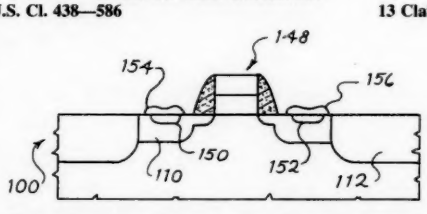
METHOD OF METAL/POLYSILICON GATE FORMATION IN A FIELD EFFECT TRANSISTOR

Sergey Lopatin, Santa Clara; Takeshi Nogami, Sunnyvale, and Shekhar Pramanik, Fremont, all of Calif., assignors to Advanced Micro Device, Sunnyvale, Calif.

Filed Dec. 7, 1998, Appl. No. 206,799

Int. Cl.[7] H01L *21/28;21/335*

U.S. Cl. 438—586 **13 Claims**



1. A method for manufacturing a field effect transistor, the method comprising the steps of:

forming source and drain regions in a semiconductor substrate;

depositing polysilicon on a surface of the semiconductor substrate between the source and drain regions;

forming first and second oxide spacers adjacent the polysilicon on the surface of the semiconductor substrate;

forming a masking layer covering substantially all the semiconductor substrate;

selectively removing portions of the masking layer to expose at least selected portions of the polysilicon;

removing a part of the selected portions of the polysilicon to an etch depth to define a trench between the first and second oxide spacers, the trench exposing a deposition surface of the polysilicon for forming the metallpolysilicon layer; and

selectively depositing electroless metal to form a metal/polysilicon gate in the trench at the selected portions of the polysilicon.

6,015,748

METHODS OF FABRICATING INTEGRATED CIRCUIT MEMORY DEVICES INCLUDING SILICIDE BLOCKING LAYERS ON MEMORY CELL TRANSISTOR SOURCE AND DRAIN REGIONS

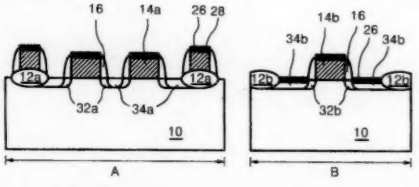
Hong-Ki Kim, Seoul; Duck-Hyung Lee, Kyungki-do, and Chang-Sik Choi, Kyungki-do, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed May 4, 1999, Appl. No. 304,355

Claims priority, application Rep. of Korea, May 21, 1998, 98-18369

Int. Cl.[7] **H01L** *21/3205*

U.S. Cl. 438—592 **12 Claims**



1. A method of fabricating an integrated circuit memory device comprising the steps of:

fabricating an array of memory cell field effect transistors and a plurality of peripheral circuit field effect transistors that are spaced-apart from the array of memory cell transistors in an integrated circuit substrate, the memory cell transistors comprising spaced-apart memory cell transistor source and drain regions and a memory cell gate therebetween, the peripheral circuit transistors comprising spaced-apart peripheral circuit transistor source and drain regions and a peripheral circuit gate therebetween;

forming a silicide blocking layer on the memory cell transistor source and drain regions; and

siliciding the integrated circuit substrate to thereby form a silicide layer on the memory cell gates, on the peripheral circuit source and drain regions and on the peripheral circuit gates, such that the memory cell transistor source and drain regions are free of the silicide layer thereon.

6,015,749

METHOD TO IMPROVE ADHESION BETWEEN COPPER AND TITANIUM NITRIDE, FOR COPPER INTERCONNECT STRUCTURES, VIA THE USE OF AN ION IMPLANTATION PROCEDURE

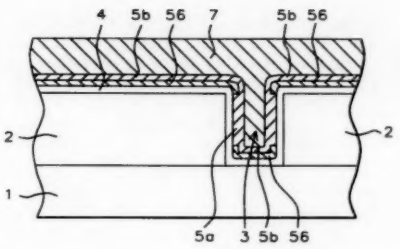
Chung-Shi Liu; Chen-Hua Douglas Yu; Jane-Bai Lai, and Lih-Juann Chen, all of Hsinchu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-chu, Taiwan

Filed May 4, 1998, Appl. No. 72,004

Int. Cl.[7] **H01L** *21/4763*

U.S. Cl. 438—628 **18 Claims**

1. A method for forming a metal interconnect structure, on a semiconductor substrate, comprising the steps of:



providing a insulator layer, on said semiconductor substrate, and providing a contact hole in said insulator layer, exposing underlying conductive elements;

depositing a barrier layer;

depositing a copper seed layer;

ion implanting germanium ions into a first region of said copper seed layer, in which said copper seed layer, and said barrier layer, reside on the top surface of said insulator layer, and ion implanting said germanium ions into a second region of said copper seed layer, in which said copper seed layer, and said barrier layer reside on the top surface of said conductive elements, located at the bottom of said contact hole;

depositing a thick copper layer;

annealing, before or after deposition of said thick copper layer, to form a Cu_3Ge intermetallic layer, with the formation of said Cu_3Ge intermetallic layer consuming all of said germanium ions, and consuming a bottom portion of said copper seed layer, and with said Cu_3Ge intermetallic layer forming in said first region of said copper seed layer, and forming said Cu_3Ge intermetallic layer in said second region of said copper seed layer; and

patterning, via use of dry etching or damascene procedures, of said thick copper layer, of said copper seed layer, of said Cu_3Ge intermetallic layer, and of said barrier layer, to form said metal interconnect structure.

6,015,750

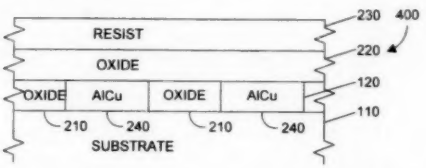
METHOD FOR IMPROVING VISIBILITY OF ALIGNMENT TARGET IN SEMICONDUCTOR PROCESSING

James A. Bruce, Williston; Steven John Holmes, Milton, and Robert K. Leidy, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/772,709, Dec. 23, 1996, Pat. No. 5,760,483. This application Jan. 15, 1998, Appl. No. 7,694.

Int. Cl.[7] **G01B** *11/27*

U.S. Cl. 438—636 **10 Claims**



1. A method for improving alignment target visibility on a semiconductor wafer comprising the steps of:

(A) providing the semiconductor wafer, the semiconductor wafer including at least one metallic alignment target having a reflectivity greater than a reflectivity of an adjacent material to the at least one metallic alignment target; and

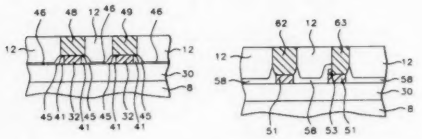
(B) increasing a difference between the reflectivity of the at least one metallic alignment target and the reflectivity of the adjacent material by modifying at least a portion of the semiconductor wafer overlying the at least one metallic alignment target.

6,015,751

SELF-ALIGNED CONNECTION TO UNDERLAYER METAL LINES THROUGH UNLANDED VIA HOLES

Meng-Chang Liu, Chia-yi, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Hsin-chu, Taiwan

Filed Apr. 6, 1998, Appl. No. 55,438
Int. Cl.[7] H01L *21/4763*
U.S. Cl. 438—637 **19 Claims**



1. A method of forming via connections, comprising the steps of:

providing a substrate having a layer of first dielectric formed thereon;

forming electrodes from a first conducting material, each said electrode having a top surface and sidewalls, on said layer of first dielectric, wherein said top surfaces of said electrodes have a number of contact regions;

forming a first layer of second dielectric on substrate thereby covering said electrodes;

etching back said first layer of said second dielectric using a first etching means thereby forming first spacers of said second dielectric on said sidewalls of said electrodes;

forming a second layer of said second dielectric on said substrate thereby covering said first spacers of said second dielectric on said sidewalls of said electrodes;

etching back said second layer of said second dielectric using a second etching means thereby forming second spacers of said second dielectric on said first spacers of said second dielectric and removing all of said second dielectric from said top surfaces of said electrodes, wherein said second spacers formed on said first spacers have a total spacer width;

forming a layer of third dielectric on said substrate thereby covering said electrodes, said first spacers of said second dielectric and said second spacers of said second dielectric;

etching via holes in said layer of third dielectric using a third etching means thereby removing said third dielectric from part or all of said contact regions of said electrodes, wherein said third etching means provides an etching rate for said third dielectric at least ten times greater than the etching rate for said second dielectric; and

filling said via holes with a second conducting material.

6,015,752

ELEVATED SALICIDE TECHNOLOGY

Qi Xiang, Santa Clara, and Shekhar Pramanick, Fremont, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 30, 1998, Appl. No. 106,769
Int. Cl.[7] H01L *21/283;21/288*
U.S. Cl. 438—655 **18 Claims**

1. A method of manufacturing a semiconductor device, the method comprising:

forming a structure comprising:

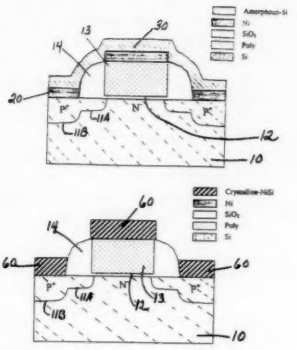
a crystalline silicon substrate;

source/drain regions in the substrate with a channel region therebetween;

a gate dielectric layer on the substrate over the channel region;

a polycrystalline silicon gate electrode, having an upper surface and side surfaces, on the gate dielectric layer; and

a dielectric sidewall spacer on each side surface of the gate electrode, leaving a portion of the source/drain regions exposed;



selectively depositing a metal layer on the exposed portions of the source/drain regions and on the upper surface of the gate electrode with substantially no metal depositing on the dielectric sidewall spacers;

depositing a layer of amorphous silicon on the deposited metal layers and sidewall spacers; and

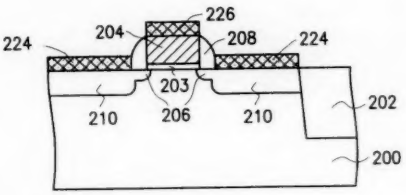
heating to react the amorphous silicon with the metal to form a metal silicide layer on the exposed portions of the source/drain regions and on the upper surface of the gate electrode.

6,015,753

METHOD OF FORMING A SELF-ALIGNED SILICIDE

Tony Lin, Kao Hsiung Hsien; Hua-Chou Tseng, Hsinchu, and Water Lur, Taipei, all of Taiwan, assignors to United Microelectronics Corp., Taipei, Taiwan

Filed Jun. 24, 1998, Appl. No. 103,888
Claims priority, application Taiwan, May 18, 1998, 87107654
Int. Cl.[7] H01R *13/10*
U.S. Cl. 438—682 **13 Claims**



1. A method of forming a self-aligned silicide (salicide), the method comprising the steps of:

providing a substrate on which is formed a field effect transistor comprising a gate, a source/drain region and a spacer formed on each sidewall of the gate;

performing a first selective epitaxial process and a second selective epitaxial process to form an amorphous silicon layer on at least one selected from a group consisting of the gate, and the source/drain region;

doping a molybdenum impurity into the amorphous silicon layer;

forming a metal layer over the substrate;

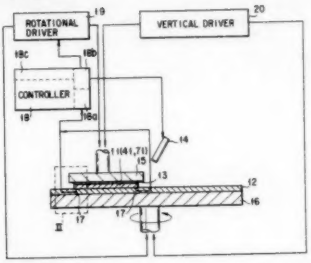
performing a thermal annealing process to convert the metal layer into a salicide layer; and

removing an unreacted portion of the metal layer.

6,015,754
CHEMICAL MECHANICAL POLISHING APPARATUS AND METHOD

Yasukazu Mase; Yoshitaka Matsui, both of Yokohama; Takeshi Kubota, Ichikawa, and Toshihiko Kitamura, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1997, Appl. No. 996,695
Claims priority, application Japan, Dec. 25, 1996, 8-344733
Int. Cl.[7] H01L *21/302;* **C23F** *1/02*
U.S. Cl. 438—692 **20 Claims**



1. A chemical mechanical polishing apparatus comprising:

a polishing mechanism for subjecting a target surface of a target object to a polishing treatment, by moving said target surface and a polishing surface of a polishing member relative to each other while supplying a polishing liquid between said target surface and said polishing surface;

a measuring mechanism for measuring an electric property comprising electric resistance or a property representing said resistance between a pair of measuring points on said target surface, while subjecting said target surface to said polishing treatment;

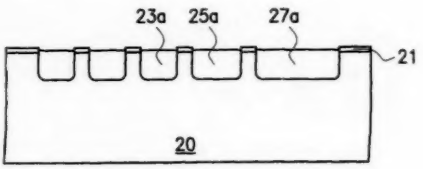
a controller for causing said polishing treatment to be ended by comparing detected values derived from measured values of said electric property with a reference value set to correspond to an end point of said polishing treatment; and

wherein said controller processes said reference values and said detected values as values of a changing rate in said electric resistance.

6,015,755
METHOD OF FABRICATING A TRENCH ISOLATION STRUCTURE USING A REVERSE MASK

Coming Chen, Taoyuan Hsien; Juan-Yuan Wu, Hsien, and Water Lur, Taipei, all of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

Filed Sep. 29, 1998, Appl. No. 162,576
Claims priority, application Taiwan, May 11, 1998, 87107201
Int. Cl.[7] H01L *21/00*
U.S. Cl. 438—692 **20 Claims**



1. A method of forming a trench isolation structure using a reverse mask, comprising the steps of:

providing a semiconductor substrate;

forming a first trench and a second trench in the substrate, wherein the width of the second trench is greater than the first trench, and furthermore the width of the first trench is smaller than a fixed value while the width of the second trench is greater than the fixed value;

forming a conformal insulating layer over the first trench and the second trench, wherein a recess cavity is formed on the surface of the conformal insulating layer above the second trench;

forming a reverse mask layer over the conformal insulating layer;

patterning the reverse mask layer so that it is selectively formed over specific regions of the conformal insulating layer, including the regions having a recess cavity but exposing other regions of the conformal insulating layer;

etching the conformal insulating layer using the patterned reverse mask layer as a mask to form a patterned conformal insulating layer underneath the reverse mask layer;

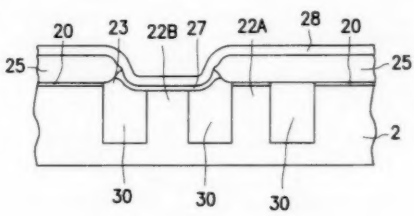
removing the reverse mask layer to expose protruding insulating structures; and

polishing the protruding insulating structures to expose the semiconductor substrate.

6,015,756
TRENCH-SHAPED READ-ONLY MEMORY AND ITS METHOD OF FABRICATION

Jemmy Wen, Hsinchu, Taiwan, assignor to United Microelectronics Corporaiton, Taiwan

Division of application No. 08/629,632, Apr. 9, 1996, Pat. No. 5,831,314. This application Jul. 23, 1997, Appl. No. 898,943.
Int. Cl.[7] H01L *21/8246*
U.S. Cl. 438—695 **14 Claims**



1. A method for fabricating a read-only memory for storing a first memory state and a second memory state, comprising the steps of:

(a) providing a silicon substrate;

(b) patterning and etching said substrate to form a plurality of spaced apart trenches to define a plurality of cell regions between each two adjacent said trenches, wherein the cell regions include a first cell region storing said first memory state and a second cell region storing said second memory state;

(c) forming a silicon layer filling in said trenches to form a plurality of bit lines therein, said bit lines overlying said substrate;

(d) forming a shielding layer on said silicon layer to cover said second cell region storing said second memory state;

(e) forming a first dielectric layer overlying said first cell region storing said first memory state but not overlying said second cell region storing said second memory state, said first dielectric layer formed by oxidizing said silicon layer not covered by said shielding layer;

(f) removing said shielding layer;

(g) forming openings to expose said second cell region storing said second memory state by etching said silicon layer utilizing said first dielectric as masking;

(h) forming a second dielectric layer overlying said openings; and

(i) forming a plurality of word lines over said first and second dielectric layers.

6,015,757

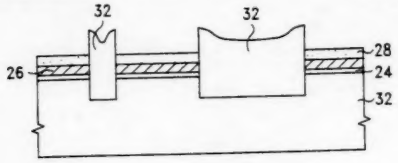
METHOD OF OXIDE ETCHING WITH HIGH SELECTIVITY TO SILICON NITRIDE BY USING POLYSILICON LAYER

Chia-Shiung Tsai; Kuei-Ying Lee, and Hun-Jan Tao, all of Hsinchu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Co. Ltd., Taiwan

Filed Jul. 2, 1997, Appl. No. 887,034

Int. Cl.[7] H01L *21/302*

U.S. Cl. 438—697 **20 Claims**



1. A method of forming a shallow trench isolation on a wafer, said method comprising the following steps of:

forming a pad layer on said wafer;

forming a silicon nitride layer over said pad layer;

forming a hard mask layer over said silicon nitride layer;

forming a trench by etching said hard mask layer, said silicon nitride layer, said pad layer and said wafer;

forming a trench filling layer for isolation on said hard mask layer and filling into said trench, a first etching rate of said trench filling layer being faster than a second etching rate of said hard mask layer; and

selectively etching said trench filling layer, resulting in a residual protruded trench filling layer remaining over said trench to act as a reverse tone structure, wherein said hard mask is used to prevent said silicon nitride layer from being etched during said selectively etching.

6,015,758

METHOD OF STRIPPING A WAFER OF ITS FILM WITH GAS INJECTED INTO A CVD APPARATUS IN WHICH THE WAFER IS DISPOSED

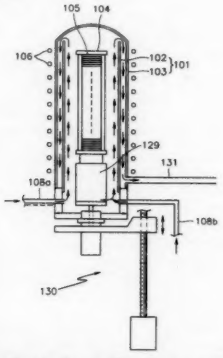
Joong-il An; Kyung-su Kim; Jung-su Lim, all of Kyungki-do, and Jung-ki Kim, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 26, 1998, Appl. No. 140,332

Claims priority, application Rep. of Korea, Oct. 10, 1997, 97-52120

Int. Cl.[7] H01L *21/00*

U.S. Cl. 438—706 **18 Claims**



1. A method of stripping a film from a wafer, said method comprising the steps of:

loading a wafer having a substrate and a film disposed on the substrate into a chamber of a chemical vapor deposition apparatus; and

injecting gas into the chamber of the chemical vapor deposition apparatus to thereby strip the wafer of said film.

6,015,759

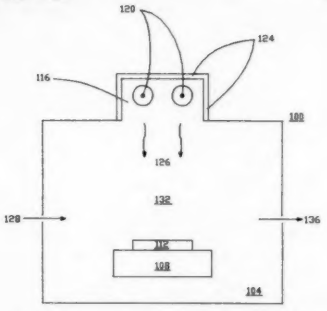
SURFACE MODIFICATION OF SEMICONDUCTORS USING ELECTROMAGNETIC RADIATION

Ashraf R. Khan, Fremont; Sasangan Ramanathan, San Ramon, and Giovanni Antonio Foggiato, Morgan Hill, all of Calif., assignors to Quester Technology, Inc., Fremont, Calif.

Filed Dec. 8, 1997, Appl. No. 986,916

Int. Cl.[7] H01L *21/00*

U.S. Cl. 438—707 **61 Claims**



48. A method for preparing a semiconductor wafer, comprising:

placing said wafer in a chamber having a moiety capable of emitting electromagnetic radiation of at least one of vacuum ultraviolet wavelengths and ultraviolet wavelengths into said chamber; and

exposing said moiety to an electric field sufficient to generate at least one of vacuum ultraviolet and ultraviolet radiation from said moiety; thereby exposing the wafer to said radiation.

6,015,760

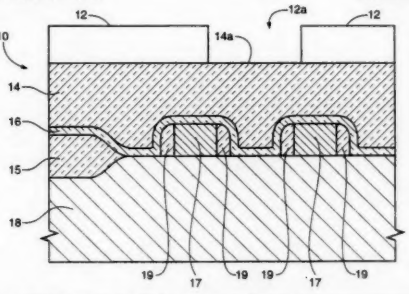
METHOD FOR ENHANCING OXIDE TO NITRIDE SELECTIVITY THROUGH THE USE OF INDEPENDENT HEAT CONTROL

David S. Becker; Guy T. Blalock, both of Boise, Id., and Fred L. Roe, San Jose, Calif., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/152,755, Nov. 15, 1993, Pat. No. 5,880,036, which is a continuation-in-part of application No. 07/898,505, Jun. 15, 1992, Pat. No. 5,286,344. This application Aug. 4, 1997, Appl. No. 905,891.

Int. Cl.[7] H01L *21/302*

U.S. Cl. 438—714 **24 Claims**



1. A method of selectively etching a layered structure, comprising steps of:

providing a first, etch stop, material layer comprising silicon nitride;

providing a layer of a second, different material over at least a portion of said first material layer;

etching a portion of said second, different material layer selectively to said first material with a fluorinated plasma to expose a portion of said first material; and

maintaining said layered structure above a temperature of at least 30 degrees C. during said step of etching.

6,015,761

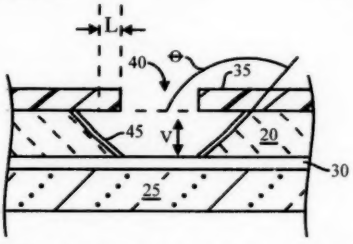
MICROWAVE-ACTIVATED ETCHING OF DIELECTRIC LAYERS

Walter Richardson Merry, Cupertino; William Brown; Harald Herchen, both of San Jose, and Michael D. Welch, Livermore, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jun. 26, 1996, Appl. No. 672,469

Int. Cl.[7] **H01L** *21/00*

U.S. Cl. 438—727 **37 Claims**



1. A method of etching a dielectric layer on a substrate, the method comprising the steps of:

(a) placing the substrate having the dielectric layer, in a process zone;

(b) introducing into a remote zone that is remote from the process zone, a process gas comprising (i) fluorocarbon gas, (ii) inorganic fluorinated gas, and (iii) O_2;

(c) forming microwave-activated species from the process gas by coupling microwaves into the remote zone; and

(d) introducing the microwave-activated species into the process zone to etch the dielectric layer on the substrate.

6,015,762

PLASMA CVD METHOD

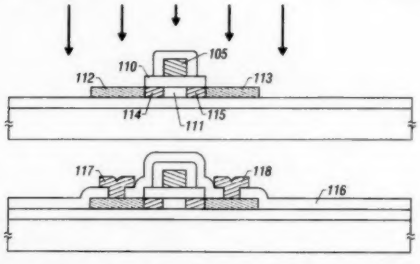
Shunpei Yamazaki, Tokyo; Mitsunori Sakama, and Masaaki Hiroki, both of Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Nov. 12, 1996, Appl. No. 748,233

Claims priority, application Japan, Nov. 10, 1995, 7-317524

Int. Cl.[7] **H01L** *21/02*

U.S. Cl. 438—788 **30 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

preparing a substrate having at least one thin film transistor formed thereon; and

forming over the thin film transistor, an interlayer insulating film through plasma CVD, said interlayer insulating film formed by the following steps:

generating a plasma of an oxidizing gas in a chamber by applying an RF power having a first voltage;

increasing the voltage of said RF power to a second voltage after generating the plasma;

supplying an organic silane gas in the chamber at the same time when or after the voltage of said RF power reaches to the second voltage, thereby forming said interlayer insulating film with the plasma of said oxidizing gas and said organic silane gas.

6,015,763

CLEANER IMPREGNATED TOWEL

Jack T. Vlasblom, Dunedin, Fla., assignor to Dotolo Research Corp., Pinellas Park, Fla.

Filed Feb. 17, 1998, Appl. No. 24,430

Int. Cl.[7] **A01N** *25/34*

U.S. Cl. 442—123 **26 Claims**

1. A cleaner impregnated towel, comprising:

a flexible, porous substrate; and

a cleaner impregnated into said substrate, said cleaner comprising:

from about 0.5 to about 90 weight percent d-limonene;

from about 0.5 to about 90 weight percent dibasic acid ester;

from about 0.5 to about 45 weight percent N-methyl-2-pyrrolidone;

from about 0.1 to about 50 weight percent secondary alcohol ethoxylate;

from about 0.1 to about 50 weight percent sodium lauryl sulfate;

from about 0.1 to about 50 weight percent polysorbate 80;

from about 0.1 to about 25 weight percent glycerine;

from about 0.1 to about 25 weight percent ethyl alcohol;

from about 0.01 to about 1 weight percent antimicrobial preservative; and optionally

from 0 to about 95 weight percent water.

6,015,764

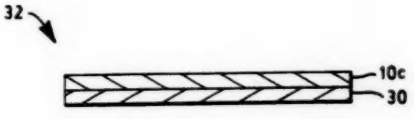
MICROPOROUS ELASTOMERIC FILM/NONWOVEN BREATHABLE LAMINATE AND METHOD FOR MAKING THE SAME

Ann L. McCormack, Cumming, and William B. Haffner, Kennesaw, both of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation of application No. 08/774,215, Dec. 27, 1996, abandoned, which is a continuation of application No. 08/773,818, Dec. 27, 1996, abandoned. This application May 2, 1997, Appl. No. 850,249.

Int. Cl.[7] **A61F** *13/15;* **B32B** *3/26;31/16*

U.S. Cl. 442—370 **26 Claims**



1. A breathable laminate comprising:

an oriented microporous relaxed unbiased film layer (**10C**) comprising an elastomeric polymer resin and at least 30% by weight of a filler having a particle size that contributes to pore formation and coated with a stearic acid,

the relaxed unbiased film layer formed from an unstretched filled film (**10A**) having an original length and a stretched

length (**10B**), said relaxed unbiased film layer including a permanent elongation of at least about 1.5 times the original length,

and said relaxed unbiased film layer (**10C**) capable of having a room-temperature biased length that is at least about one and a half times said relaxed unbiased film layer length and a release length, upon release of a biasing force of no more than one and one quarter of the relaxed unbiased film layer length, having a water vapor transmission rate of at least about 1,000 g/m^2-24 hrs; and

wherein said elastomeric polymer includes at least one of a) ethylene-propylene elastomer blends, b) ethylene copolymers, c) block copolymers including styrene, d) terpolymers of ethylene and propylene, e) molecular blends of at least two polymers of propylenes or polymers of propylene with ethylene, f) ethylene vinyl acetate, g) ethylene-normal butyl acrylate, or h) ethylene methyl acrylate; and

at least one support layer bonded to said film layer.

6,015,765

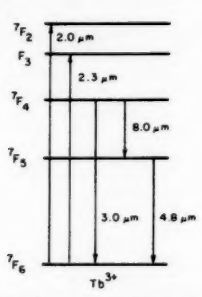
RARE EARTH SOLUBLE TELLURIDE GLASSES

Barry B. Harbison, Dunkirk; Jasbinder S. Sanghera, Greenbelt; L. Brandon Shaw, Laurel, all of Md., and Ishwar D. Aggarwal, Fairfax Station, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1997, Appl. No. 997,800

Int. Cl.[7] **C03C** *3/32;13/04*

U.S. Cl. 501—40 **20 Claims**



1. A glass comprising, on a mol basis, 20%–60% tellurium, 10–50% arsenic, 4–35% germanium, 0.5–15% gallium, up to 15% iodine, and up to 30% selenium, and wherein up to the entire amount of gallium is substituted with indium.

6,015,766

CATALYST SYSTEMS FOR OLEFIN POLYMERIZATION BASED ON METALLOCENE COMPLEXES AND OLIGOALKYLALUMINATES WITH STERICALLY HINDERED ALKYL GROUPS AS COCATALYSTS

Yury V Kissin, East Brunswick, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 18, 1997, Appl. No. 993,167

Int. Cl.[7] **B01J** *31/00;37/00;* **C08F** *4/02;4/60*

U.S. Cl. 502—103 **16 Claims**

1. A catalyst composition for polymerization of alpha-olefins comprising the contact product of a metallocene complex of a transition metal of the formula

$$Cp_xMA_yB_z$$

wherein x is 1 or 2; M is titanium, zirconium or hafnium; Cp is a cyclopentadienyl group, a substituted cyclopentadienyl group, a cyclopentadienyl group that is a part of a bicyclic or a tricyclic moiety or, when x is 2, the two cyclopentadienyl groups are optionally bridged to each other; and each of A and B is selected from the group consisting of a halogen atom, a hydrogen atom, an alkyl group, and combinations thereof; providing that x+y+z is equal to the valence of M; and

a cocatalyst, alkylaluminate the general formula $[—Al(CH_3)O]_p—[Al(OR)O]_q—$, wherein R is a sterically hindered alkyl group and the q:p ratio varies from 1:10 to 1:0, said sterically hindered alkyl group containing a trisubstituted aliphatic carbon atom, —CR'R"R'", or a disubstituted aliphatic carbon atom, —CHR'R", where substituents R', R" and R'" are the same or different aliphatic, aromatic or alkylaromatic groups.

6,015,767

SUPPORTED POLYMERISATION CATALYSTS

Vernon Charles Gibson, London, and Warren Reed, Sunbury-on-Thames, both of United Kingdom, assignors to BP Chemicals Limited, London, United Kingdom

Filed Jul. 1, 1997, Appl. No. 886,454

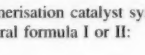
Claims priority, application United Kingdom, Jul. 2, 1996, 9613814

Int. Cl.[7] **B01J** *31/00;31/06*

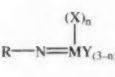
U.S. Cl. 502—152 **9 Claims**

1. An olefin polymerisation catalyst system comprising a complex having the general formula I or II:

(I)



(II)



wherein in formula (I) M is V, Nb or Ta and in formula (II) M is Cr, Mo or W; R is selected from alkyl and aryl, and in formula II the R groups may be the same or different; X is an organic group containing a cyclopentadienyl nucleus, Y is a univalent anionic ligand, the Y groups may be the same or different; n is 0 or 1; the complex of formula (I) or (II) being supported on a substrate comprising a polyaminostyrene or a copolymer of styrene and aminostyrene.

6,015,768

PROCESS FOR PREPARATION OF A HETEROGENEOUS CATALYST USEFUL FOR PREPARATION OF SUPER HIGH MOLECULAR WEIGHT POLYMERS OF ALPHA-OLEFIN

Sabyasachi Sinha Ray, House No. B-65, Sarita Vihar, New Delhi-110044, India; Deepak Kumar Tuli, House No. 266, Sector-9; Meeta Sharma, House No. 172, Sector-9, both of Faridabad-121006, India; Madan Mohan Rai, House No. 886, Sector-15; Sobhan Ghosh, House No. 188, Sector-14, both of Faridabad, India, 121007; Akhilesh Kumar Bhatnagar, House No. 205, Sector-7A, Faridabad-121006, India; Prabhat Kumar Saxena, E-40, NCL Colony, and Swaminathan Sivaram, C-11/2, NCL Colony, both of Pure 411 008, India

Filed Apr. 22, 1998, Appl. No. 64,139

Int. Cl.[7] **B01J** *31/00;27/135;23/00;23/58*

U.S. Cl. 502—300 **26 Claims**

1. A process for the preparation of heterogeneous zirconium based catalyst useful for polymerization of alpha-olefins to high molecular weight poly alpha-olefins which consists essentially of the steps of:

a) mixing zirconium alkoxide or aryloxide with anhydrous magnesium chloride in an inert diluent under dry conditions and

heating the mixture to a temperature of 60–100° C. for 1 to 6 hours to form a zirconium-magnesium compound in the form of a slurry,

b) treating the zirconium-magnesium compound with an organoaluminum compound and heating the zirconium-magnesium compound with said organoaluminum compound to a temperature of 60–100° C. for 1 to 6 hours, and

c) recovering said catalyst.

6,015,769

VINYL ACETATE CATALYST COMPRISING METALLIC PALLADIUM, GOLD AND COPPER SUPPORTED ON A CARRIER AND PREPARED WITH POTASSIUM AURATE

Tao Wang, Corpus Christi, Tex., assignor to Celanese International Corporation, Dallas, Tex.

Filed Jun. 2, 1998, Appl. No. 88,980

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B01J** *23/72;23/00;23/59;23/42*

U.S. Cl. 502—331 **26 Claims**

1. A catalyst for the production of vinyl acetate by reaction of ethylene, oxygen and acetic acid comprising a porous support on the porous surfaces of which is deposited catalytically effective amounts of metallic palladium, gold, and copper, said catalyst having been prepared by steps comprising impregnating said porous support, the porous surfaces of which contain catalytically effective amounts of prereduced metallic palladium and copper, with a solution of potassium aurate, and reducing the potassium aurate to a catalytically effective amount of metallic gold.

6,015,770

REVERSIBLE THERMOSENSITIVE RECORDING MATERIAL AND METHOD OF USE THEREOF

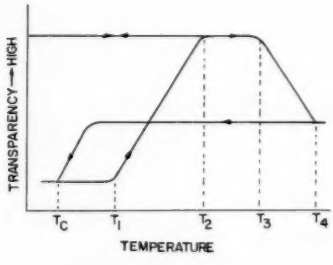
Tetsuya Amano, Numazu; Yoshihiko Hotta, Mishima; Kunichika Morohoshi, Numazu, and Kazumi Suzuki, Shizuoka-ken, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 5, 1997, Appl. No. 905,927

Claims priority, application Japan, Aug. 6, 1996, 8-221867; Aug. 4, 1997, 9-221228

Int. Cl.[7] **B41M** *5/36*

U.S. Cl. 503—201 **34 Claims**



29. A reversible image forming method comprising:

preparing a reversible thermosensitive recording material comprising a substrate having at least two opposed sides and a recording layer which is formed overlying at least one part of one side of the substrate, said recording layer comprising a particulate low-molecular weight organic material dispersed in a resin and from about 5% to about 60% of a reactive polymer;

firstly-heating the recording layer at a first coloring temperature higher than room temperature by applying heat energy in a first color recordable energy range of the recording layer to form a first color image in the recording layer;

secondly-heating the recording layer at a second coloring temperature higher than the first coloring temperature; and

cooling the recording layer to form a second color image in the recording layer,

wherein provided that an initial first color recordable energy range is (E1) and a changed first color recordable energy range of the recording material which has been preserved at 35° C. for 48 hours while being in a second color state is (ED), a changing rate (EC) which is represented by the following equation is less than about 35%:

$$EC=\{(E1-ED)/E1\}\times 100.$$

6,015,771

THERMALLY-RESPONSIVE RECORD MATERIAL

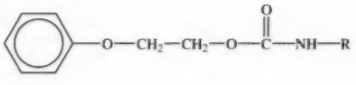
Mark Robert Fisher, Appleton; John Charles DeBraal, Kaukauna, both of Wis.; Guido Steffan, Odenthal, and Peter P. Wenzl, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 22, 1998, Appl. No. 83,807

Int. Cl.[7] **B41M** *5/30*

U.S. Cl. 503—209 **17 Claims**

1. A thermally-responsive record material comprising a support having provided thereon in substantially contiguous relationship a chromogenic material, an acidic developer material, a carbamate of the formula



wherein R is selected from alkyl, aryl and aralkyl, said alkyl moiety being from one to eight carbons, and a suitable binder therefore.

6,015,772

THERMAL DYE TRANSFER RECEIVING ELEMENT

Elizabeth G. Burns; Kristine B. Lawrence, both of Rochester, N.Y.; Wayne A. Bowman, Medina, Ohio, and Hwei-Ling Yau, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 8, 1998, Appl. No. 75,082

Int. Cl.[7] **B41M** *5/035;5/38*

U.S. Cl. 503—227 **15 Claims**

6. A process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer and transferring a dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a dye image-receiving layer comprising a vinyl latex polymer having the following general formula:

$$A_a\text{-}B_b\text{-}C_c$$

wherein:

A is derived from monomers which, when homopolymerized, yield a polymer having a Tg greater than 25;

a is between 5 and 45 mole percent;

B is derived from monomers which, when homopolymerized, yield a polymer having a Tg less than 10;

b is between 35 and 90 mole percent;

C is a repeat unit derived from the salt of an anionic water-soluble monomer; and

c is between 0 and 20 mole percent.

6,015,773

CROP PROTECTION COMPOSITION COMPRISING A CROP PROTECTION SOLID PARTICLE COATED WITH WATER-INSOLUBLE COATING MATERIAL AND A CROP PROTECTION MIXTURE COMPRISING THE SAME

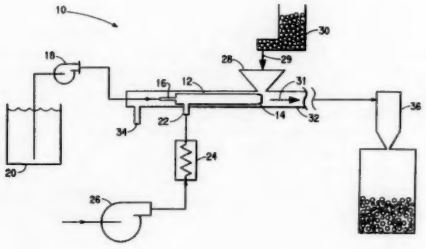
Robert David Wysong; George Bernard Beestman, both of Wilmington, and George Alan Schurr, Newark, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US96/13677, § 371 Date Feb. 25, 1998, § 102(e) Date Feb. 25, 1998, PCT Pub. No. WO97/07676, PCT Pub. Date Mar. 6, 1997

Provisional application No. 60/002,901, Aug. 29, 1995. This PCT application Aug. 23, 1996, Appl. No. 29,200.

Int. Cl.[7] A01N *25/28*

U.S. Cl. 504—116 **20 Claims**



1. A crop protection composition, comprising a mononucleate crop protection solid particle coated with a water-insoluble coating material, wherein the coating material is selected from the group consisting of: wood rosin, rosin derivatives, waxes, fatty derivatives, sterols, long-chain sterol esters and sulfur, and the diameter of the crop protection composition is in the range of 0.5 to 50 micrometers.

6,015,774

PYRAZIN-2-ONE DERIVATIVES, THEIR USE, AND INTERMEDIATES FOR THEIR PRODUCTION

Akira Shuto, Ashiya; Hisayuki Hoshi, Toyonaka, and Yuzuru Sanemitsu, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP96/02671, § 371 Date Mar. 20, 1998, § 102(e) Date Mar. 20, 1998, PCT Pub. No. WO97/11060, PCT Pub. Date Mar. 27, 1997

PCT Filed Sep. 18, 1996, Appl. No. 43,470

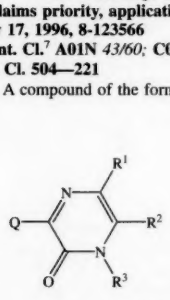
Claims priority, application Japan, Sep. 22, 1995, 7-244107; May 17, 1996, 8-123566

Int. Cl.[7] A01N *43/60;* **C07D** *241/18;403/04;405/04;413/04*

U.S. Cl. 504—221 **34 Claims**

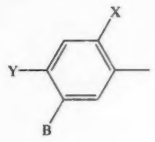
1. A compound of the formula:

(I)

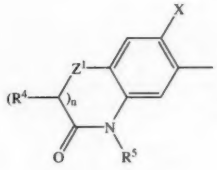


wherein R^1 is hydrogen or C_1–C_3 alkyl; R^2 is C_1–C_3 haloalkyl; R^3 is C_1–C_6 alkyl optionally substituted with one or more halogen atoms; C_3–C_6 alkenyl, or C_3–C_6 alkynyl; and Q is (Q-1), (Q-2), (Q-3), (Q-4), or (Q-5) of the formula:

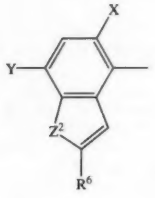
(Q-1)



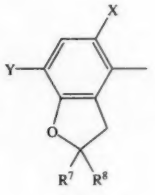
(Q-2)



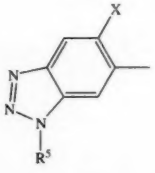
(Q-3)



(Q-4)



(Q-5)



wherein X is hydrogen or halogen;

Y is halogen, nitro, cyano, or trifluoromethyl;

Z^1 is oxygen, sulfur, NH, or methylene;

Z^2 is oxygen or sulfur;

n is 0 or 1;

B is hydrogen, halogen, nitro, cyano, chlorosulfonyl, —OR^{10}, —SR^{10}, —SO_2OR^{10}, —$N(R^{10})R^{11}$, —$SO_2N(R^{11})R^{12}$, —$NR^{11}(COR^{13})$, —$NR^{11}(SO_2R^{14})(SO_2R^{15})$, —$N(SO_2R^{14})(COR^{13})$, —$NR^{11}(COOR^{13})$, —$COOR^{13}$, —$CON(R^{11})R^{12}$, —$CSN(R^{11})R^{12}$, —$COR^{16}$, —$CR^{17}$=$CR^{18}CHO$, —$CR^{17}$=$CR^{18}COOR^{10}$, —$CR^{17}$=$CR^{18}CON(R^{11})R^{12}$, —$CH_2CHWCOOR^{13}$, or —$CH_2CHWCON(R^{11})R^{12}$;

R^4 is hydrogen or C_1–C_3 alkyl;

R^5 is hydrogen, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_3–C_6 alkenyl, C_3–C_6 haloalkenyl, C_3–C_6 alkynyl, C_3–C_6 haloalkynyl, cyano C_1–C_6 alkyl, C_2–C_8 alkoxyalkyl, C_3–C_8 alkoxyalkoxyalkyl, carboxy C_1–C_6 alkyl, (C_1–C_6 alkoxy)carbonyl C_1–C_6 alkyl, {(C_1–C_4 alkoxy) C_1–C_4 alkoxy}carbonyl C_1–C_6 alkyl, (C_3–C_8 cycloalkoxy)carbonyl C_1–C_6 alkyl, —$CH_2CON(R^{11})R^{12}$, —$CH_2COON(R^{11})R^{12}$, —$CH(C_1$–C_4 alkyl)$CON(R^{11})R^{12}$, —$CH(C_1$–C_4 alkyl)$COON(R^{11})R^{12}$,

C_2–C_8 alkylthioalkyl, C_1–C_6 alkylsulfonyl, C_1–C_6 haloalkylsulfonyl, (C_1–C_8 alkyl)carbonyl, (C_1–C_8 alkoxy)carbonyl, or hydroxy C_1–C_6 alkyl;

R^6 is C_1–C_6 alkyl, C_1–C_6 haloalkyl, formyl, cyano, carboxyl, hydroxy C_1–C_6 alkyl, C_1–C_6 alkoxy C_1–C_6 alkyl, C_1–C_6 alkoxy C_1–C_6 alkoxy C_1–C_6 alkyl, (C_1–C_6 alkyl)carbonyloxy C_1–C_6 alkyl, (C_1–C_6 haloalkyl)carbonyloxy C_1–C_6 alkyl, (C_1–C_6 alkoxy)carbonyl, or (C_1–C_6 alkyl)carbonyl;

R^7 is hydrogen or C_1–C_3 alkyl; and

R^8 is C_1–C_6 alkyl, C_1–C_6 haloalkyl, hydroxy C_1–C_6 alkyl, C_2–C_8 alkoxyalkyl, C_3–C_{10} alkoxyalkoxyalkyl, (C_1–C_5 alkyl)carbonyloxy C_1–C_6 alkyl, (C_1–C_6 haloalkyl)carbonyloxy C_1–C_6 alkyl, carboxyl, carboxy C_1–C_6 alkyl, (C_1–C_8 alkoxy)carbonyl, (C_1–C_6 haloalkoxy)carbonyl, (C_3–C_{10} cycloalkoxy)carbonyl, (C_3–C_8 alkenyloxy)carbonyl, (C_3–C_8 alkynyloxy)carbonyl, aminocarbonyl, (C_1–C_6 alkyl)aminocarbonyl, di(C_1–C_6 alkyl)aminocarbonyl, (C_1–C_6 alkyl)aminocarbonyloxy C_1–C_6 alkyl, or di(C_1–C_6 alkyl)aminocarbonyloxy C_1–C_6 alkyl;

wherein W is hydrogen, chlorine, or bromine;

R^{10} is hydrogen, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_3–C_8 cycloalkyl, C_3–C_6 alkenyl, C_3–C_6 haloalkenyl, C_3–C_6 alkynyl, C_3–C_6 haloalkynyl, cyano C_1–C_6 alkyl, C_2–C_8 alkoxyalkyl, C_2–C_8 alkylthioalkyl, carboxy C_1–C_6 alkyl, (C_1–C_6 alkoxy)carbonyl C_1–C_6 alkyl, {(C_1–C_4 alkoxy) C_1–C_4 alkoxy}carbonyl C_1–C_6 alkyl, (C_3–C_8 cycloalkoxy)carbonyl C_1–C_6 alkyl, —$CH_2CON(R^{11})R^{12}$, —$CH_2COON(R^{11})R^{12}$, —$CH(C_1$–C_4 alkyl)$CON(R^{11})R^{12}$, or —$CH(C_1$–C_4 alkyl)$COON(R^{11})R^{12}$;

R^{11} and R^{12} are independently hydrogen, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl, cyano C_1–C_6 alkyl, C_2–C_8 alkoxyalkyl, C_2–C_8 alkylthioalkyl, carboxy C_1–C_6 alkyl, (C_1–C_6 alkoxy)carbonyl C_1–C_6 alkyl, or {(C_1–C_4 alkoxy)C_1–C_4 alkoxy}carbonyl C_1–C_6 alkyl, or R^{11} and R^{12} are combined together to form tetramethylene, pentamethylene, or ethyleneoxyethylene;

R^{13} is hydrogen, C_1–C_6 alkyl, C_1–C_6 haloalkyl, or C_3–C_8 cycloalkyl;

R^{14} and R^{15} are independently C_1–C_6 alkyl, C_1–C_6 haloalkyl, or phenyl optionally substituted with methyl or nitro;

R^{16} is hydrogen, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_2–C_6 haloalkynyl, C_2–C_8 alkoxyalkyl, or hydroxy C_1–C_6 alkyl; and

R^{17} and R^{18} are independently hydrogen or C_1–C_6 alkyl.

6,015,775

SELF-LUBRICATING SINTERED SLIDING MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Takemori Takayama, and Yoshikiyo Tanaka, both of Osaka, Japan, assignors to Komatsu Ltd., Tokyo, Japan

PCT No. PCT/JP96/02272, § 371 Date Feb. 4, 1998, § 102(e) Date Feb. 4, 1998, PCT Pub. No. WO97/05980, PCT Pub. Date Feb. 20, 1997

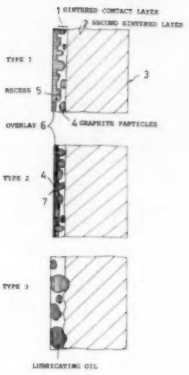
PCT Filed Aug. 7, 1996, Appl. No. 11,639

Claims priority, application Japan, Aug. 8, 1995, 7-224746

Int. Cl.[7] C10M *103/00;* **B22F** *7/02;3/24;* **C22C** *33/02*

U.S. Cl. 508—103 **23 Claims**

1. A self-lubricating sintered sliding member comprising an iron-family metal substrate and a sintered contact layer that is formed on a sliding side of the iron-family metal substrate and made from a sintered contact material containing an iron-family material, the sintered contact layer having, on a surface thereof, protrusions formed from solid lubricant particles, the surface of the



sintered contact layer where the protrusions are formed being covered with a solid lubricant layer.

6,015,776

POLYALKYLENE POLYSUCCINIMIDES AND POST-TREATED DERIVATIVES THEREOF

James J. Harrison, Novato, and William R. Ruhe, Jr., Benicia, both of Calif., assignors to Chevron Chemical Company, San Francisco, Calif.

Filed Sep. 8, 1998, Appl. No. 149,165

Int. Cl.[7] C10M *133/44;155/04*

U.S. Cl. 508—192 **18 Claims**

1. A process for preparing a polysuccinimide which comprises reacting a mixture under reactive conditions, wherein the mixture comprises:

(a) an alkenyl or alkylsuccinic acid derivative, wherein the alkenyl or alkyl substituent has a Mn of from 140 to 3000;

(b) an unsaturated acidic reagent copolymer of

(1) an unsaturated acidic reagent and

(2) an olefin having a Mn of at least 1000,

wherein the copolymer has an average degree of polymerization of from 2 to 20; and

(c) a polyamine having at least three nitrogen atoms and 4 to 20 carbon atoms.

6,015,777

SILICONE GREASES AND METHODS FOR THEIR PRODUCTION

Richard T. Lostritto, Jr., Gaithersburg, Md., and Joseph H. Groeger, Storrs, Conn., assignors to University of Connecticut, Storrs, Conn.

Provisional application No. 60/043,944, Apr. 16, 1997. This application Apr. 15, 1998, Appl. No. 60,327.

Int. Cl.[7] C10M *119/30*

U.S. Cl. 508—208 **50 Claims**

1. A grease composition comprising:

at least one silicone oil exhibiting a viscosity of from about 5,000 cS to about 200,000 cS at 25°; and

at least one silicone elastomer gel comprising a cross-linked reaction product of an organo-alkenyl-polysiloxane compound having at least two silicon-bonded alkenyl radicals per molecule and an organo-hydrogen-polysiloxane compound having at least two silicon-bonded hydrogen atoms per molecule.

6,015,778

PROCESS FOR MAKING OVERBASED CALCIUM SULFONATE DETERGENTS USING CALCIUM OXIDE AND A LESS THAN STOICHIOMETRIC AMOUNT OF WATER

Allen J. Rolfes, Mentor, Ohio, and Scot Eric Jaynes, Pendleton, N.Y., assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 27, 1998, Appl. No. 49,449

Int. Cl.[7] C10M *159/22*

U.S. Cl. 508—394 **18 Claims**

1. A process for producing an overbased oil soluble calcium sulfonate, comprising the steps of:

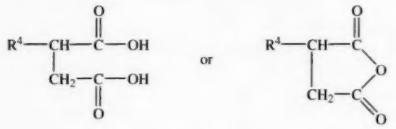
(a) mixing a substrate comprising a sulfonic acid wherein the sulfonic acid is of the formulae

$$(R^1)_x(R^2)_y\text{—T—}(SO_3H)_z \text{ or} \quad \text{(I)}$$

$$(R^2)_y\text{—T—}(SO_3H)_z \quad \text{(II)}$$

$$R^3\text{—}SO_3H \quad \text{(III)}$$

wherein R^1 is an alkyl group containing 1 or 2 carbon atoms, R^2 is an alkyl group containing at least 12 carbon atoms, R^3 is an aliphatic group containing at least 15 carbon atoms, T is a benzene or naphthalene nucleus and within (I), x, y and z are each independently an integer of 1 up to 3 times the number of aromatic nuclei present in T with the proviso that the sum of x, y and z does not exceed the unsatisfied valences of T or within (II), y is an integer of from 1 to 3 and z is an integer of from 1 to 4 with the proviso that the sum of y and z does not exceed the unsatisfied valences of T or a calcium salt of a sulfonic acid, with at least one alcohol wherein the alcohol is a mixture of methanol, isobutyl alcohol and amyl alcohol, a diluent oil, a carboxylic acid, wherein the carboxylic acid is a polybasic carboxylic acid of the formula



wherein R^4 is an aliphatic hydrocarbon based group of from 4 to 400 aliphatic carbon atoms, an acidic material of calcium chloride, water and calcium oxide to form a mixture;

(b) heating the mixture to its reflux point to form a neutral calcium salt of the acid moieties;

(c) removing a substantial portion of distillable solvents to form an intermediate residue;

(d) adding to the intermediate residue at least one alcohol, a surfactant wherein the surfactant is a calcium salt of a formaldehyde coupled aliphatic phenol, calcium oxide and water such that for every 100 parts of substrate, there are not more than 25 parts water to form an intimate mixture having a direct base number of 90–250;

(e) heating said intimate mixture (d) to below its reflux point to form a heated intimate mixture;

(f) passing gaseous carbon dioxide into the heated intimate mixture (e) to form an overbased calcium sulfonate and a mixture of calcium hydroxide, calcium carbonate and regenerated water until the direct base number is from 90–150;

(g) adding additional calcium oxide until the direct base number is from 90–250 followed by the passing of additional gaseous carbon dioxide until the direct base number is from 90–150;

(h) continuing the passing of gaseous carbon dioxide to a direct base number of 0–75 after the last portion of calcium oxide is added;

(i) removing any distillable solvents to form a final residue; and

(j) filtering the final residue to obtain a substantially solvent-free and solids-free oil soluble overbased calcium sulfonate;

with the proviso that calcium oxide is the only substantial source of overbasing calcium.

6,015,779

METHODS FOR FORMING AMORPHOUS ULTRA-HIGH MOLECULAR WEIGHT POLYALPHAOLEFIN DRAG REDUCING AGENTS

Gerald B. Eaton, Houston; Michael J. Monahan, Katy, both of Tex., and Robert J. Tipton, Tulsa, Okla., assignors to Energy & Environmental International, L.C., Houston, Tex.

Continuation-in-part of application No. 08/619,840, Mar. 19, 1996, Pat. No. 5,869,570. This application May 20, 1998, Appl. No. 81,964.

Int. Cl.[7] C10M *143/00;* **C08F** *4/44*

U.S. Cl. 508—591 **18 Claims**

1. A process for forming a drag reducing agent comprising a non-crystalline, ultra-high molecular weight polyalphaolefin having an inherent viscosity of at least about 10 decilitcrs per gram, the process comprising:

contacting alpha olelin monomers with a catalyst system in a reactant mixture,

wherein the catalyst system includes a transition metal catalyst, an alkylaluminoxane co-catalyst, and a halohydrocarbon; and

polymerizing the alpha olelin monomers at a temperature at about or less than 25° C.,

wherein during the polymerization, at least a portion of the alpha olefin monomers polymerize in the reactant mixture to provide a non-crystalline, ultra-high molecular weight polyalphaolefin.

6,015,780

FORMULATIONS FOR CLEANING HARD SURFACES COMPRISING A BETAINE SURFACTANT HAVING EXACTLY 12 CARBON ATOMS

Joaquin Llosas Bigorra, Sabadell; Nuria Bonastre Gilabert, Barberá del Vallés; Miguel Osset Hernandez, Barcelona; Xavier Closa Cruxens, S. Cugat del vallés, and Rafael Pi Subirana, Granollers, all of Spain, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Filed Apr. 8, 1998, Appl. No. 57,348

Claims priority, application Germany, Apr. 8, 1997, 197 14 369

Int. Cl.[7] C11D *1/90;1/12;3/22*

U.S. Cl. 510—237 **16 Claims**

1. A surfactant composition comprising:

(a) from 5 to 15% by weight of a single betaine, wherein the betaine has a fatty residue containing exactly 12 carbon atoms;

(b) from 3 to 18% by weight of an alkyl and/or alkenyl oligoglycoside; and

(c) from 20 to 35% by weight of a fatty alcohol ether sulfate, all weights being based on the weight of the composition.

6,015,781

DETERGENT COMPOSITIONS CONTAINING SELECTED MID-CHAIN BRANCHED SURFACTANTS

Phillip Kyle Vinson; Peter Robert Foley; Thomas Anthony Cripe; Daniel Stedman Connor, and Kenneth William Willman, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of application No. PCT/US97/06474, Apr. 16, 1997, Provisional application No. 60/015,521, Apr. 16, 1996, Provisional application No. 60/015,523, Apr. 16, 1996, Provisional application No. 60/031,844, Nov. 26, 1996. This application Oct. 13, 1998, Appl. No. 170,185.

Int. Cl.[7] C11D *1/94;3/395*

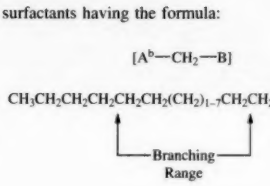
U.S. Cl. 510—302 **14 Claims**

1. A bleaching detergent composition comprising:

a) from about 0.1% to about 50% by weight of a bleaching agent;

b) from about 0.1% to about 50% by weight of a mid-chain branched surfactant selected from the group consisting of

surfactants having the formula:



wherein:

(i) one or more C_1–C_3 alkyl moieties branch from the longest linear carbon chain at the positions encompassed by the indicated branching range, with the proviso that said surfactants are substantially free of geminal branching; and

(ii) B is a hydrophilic moiety selected from sulfates, polyoxyalkylene, and alkoxylated sulfates;

c) from about 0.1% to about 99.8% by weight of detergent composition adjunct ingredients; and

wherein the composition has an in-use pH in the range 9–11.

6,015,782

PROCESS FOR MANUFACTURING BLEACHING COMPOSITIONS

Marco Petri, I-Angera Varese, Italy, and Henry Cheng Na, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US95/15950, § 371 Date Jun. 5, 1998, § 102(e) Date Jun. 5, 1998, PCT Pub. No. WO97/20909, PCT Pub. Date Jun. 12, 1997

PCT Filed Dec. 7, 1995, Appl. No. 77,794

Int. Cl.[7] C11D *3/395;3/48;7/54*

U.S. Cl. 510—379 **20 Claims**

1. A process for manufacturing a liquid bleaching composition, said process comprising the steps of:

i) mixing a source of hypochlorite and a source of bromide to form a pre-mix;

ii) selecting an organic or an inorganic derived —NH_2 compound;

iii) optionally mixing the selected —NH_2 compound with one or more carriers and/or one or more adjunct ingredients to form an —NH_2 containing composition; and

iv) combining the pre-mix from step (i) with the —NH_2 compound of step (ii) or the — NH_2 composition of step (iii) to form a bleaching composition;

wherein the pH of said bleaching composition is greater than 11.

6,015,783

PROCESS FOR REMOVAL OR BLEACHING OF SOILING OR STAINS FROM CELLULOSIC FABRIC

Claus von der Osten, Lyngby, Denmark; Joel R. Cherry, Davis, Calif.; Mads E. Bjornvad, Frederiksberg, Denmark; Jesper Vind, Lyngby, Denmark, and Michael Dolberg Rasmussen, Vallensbaek, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of application No. PCT/DK97/00042, Jan. 29, 1997. This application Mar. 6, 1997, Appl. No. 814,052.

Claims priority, application Denmark, Jan. 29, 1996, 0094/96

Int. Cl.[7] C11D *3/386*

U.S. Cl. 510—392 **11 Claims**

1. A process for removal or bleaching of soiling or stains present on cellulosic fabric, comprising contacting the fabric in an aqueous medium with an enzyme hybrid which comprises a catalytically active amino acid sequence of a non-cellulolytic enzyme linked to an amino acid sequence comprising a cellulose-binding domain, wherein:

(i) the catalytically active amino acid sequence is derived from an enzyme selected from the group consisting of amylases, proteases, lipases, pectinases and oxidoreductases, wherein the amylase is derived from a species of Bacillus, Thermoanaerobactor, or Thermoanaerobacterium; the protease is derived from a species of Bacillus or Fusarium; the lipase is derived from a species of Humicola, Rhizomucor, Penicillium, Geotricum, Rhizopus, Fusarium, Candida, Pseudomonas or Bacillus; and the oxidoreductase is selected from the group consisting of a peroxidase and a laccase, wherein the peroxidase is derived from a species of Coprinus, Fusarium, Humicola, Tricoderma, Myrothecium, Verticillum, Arthromyces, Caldariomyces, Ulocladium, Embellisia, Cladosporium, Dreschlera, Phanerochaete, Coriolus, Trametes, Rhizopus, Mucor, Streptomyces, Streptoverticillum, Bacillus, Rhodobacter, Rhodomonus, Streptococcus, or Pseudomonas and the laccase is derived from a species of Trametes, Aspergillus, Neurospora, Podospora, Botrytis, Collybia, Fomes, Lentinus, Pleurotus, Rhizoctonia, Coprinus, Psatyrella, Phlebia, Pyricularia, Rigidoporus, Myceliophthora, Schytalidium or Polyporus; and

(ii) the cellulose-binding domain is derived from an enzyme selected from the group consisting of cellulases, xylanases, mannanases, arabinofuranosidases, acetylesterases, and chitinases.

6,015,784

SECONDARY ALKYL SULFATE PARTICLES WITH IMPROVED SOLUBILITY BY COMPACTION/COATING PROCESS

Takashi Kazuta, and Fukuji Ebihara, both of Kobe, Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US97/03079, § 371 Date Mar. 10, 1999, § 102(e) Date Mar. 10, 1999, PCT Pub. No. WO97/32951, PCT Pub. Date Sep. 12, 1997

Provisional application No. 60/013,311, Mar. 8, 1996. This PCT application Feb. 26, 1997, Appl. No. 142,460.

Int. Cl.[7] C11D *11/00;1/14*

U.S. Cl. 510—446 **8 Claims**

1. A process for preparing particles of secondary (2,3) ally sulfate surfactants with improved solubility, comprising the steps of:

(a) admixing said secondary (2,3) alkyl sulfate in particulate form with a water-soluble particulate organic material selected from the group consisting of polyacrylates, acrylate/maleate copolymers, and mixtures thereof to provide a substantially homogeneous powder mixture containing at least about 10%, by weight, of said secondary (2,3) alkyl sulfate;

(b) compacting said powder mixture from step (a) into chips;

(c) comminuting the chips from step (b) into particles having a size in the range from about 100 to about 2000 micrometers and a density of at least about 500 g/L;

(d) coating said particles from step (c) with a nonionic surfactant binder, and thereafter, coating said particles with a free-flow aid to provide free-flowing particles;

(e) optionally, sizing the coated particles of step (d) to a mean particle size in the range from about 100 to about 1500 micrometers.

6,015,785

AGLUCONE ISOFAVONE ENRICHED VEGETABLE PROTEIN EXTRACT AND ISOLATE AND PROCESS FOR PRODUCING

Jerome L. Shen, St. Louis, and Barbara A. Bryan, University City, both of Mo., assignors to Protein Technologies International, Inc., St. Louis, Mo.

Continuation of application No. 08/307,752, Apr. 12, 1996, Pat. No. 5,763,389. This application Oct. 31, 1997, Appl. No. 961,829.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *31/35;38/02;* **C07K** *14/415;* **C12P** *17/06*

U.S. Cl. 514—2 **2 Claims**

1. A vegetable protein isolate comprising a protein isolate having a dry basis genistein content of about 1.5 mg/g to about 3.5 mg/g.

6,015,786

METHOD FOR INCREASING SEX STEROID LEVELS USING IGF OR IGF/IGFBP-3

Desmond Mascarenhas, Los Altos Hills, and Martin Sanders, Hillsborough, both of Calif., assignors to Celtrix Pharmaceuticals, Inc., San Jose, Calif.

Continuation-in-part of application No. 08/805,807, Feb. 25, 1997, abandoned. This application Apr. 21, 1997, Appl. No. 837,603.

Int. Cl.[7] A61K *38/30*

U.S. Cl. 514—12 **6 Claims**

1. A method for increasing sex steroid levels in a subject, comprising administering an effective amount of IGF-I to said subject in combination with IGFBP-3.

6,015,787

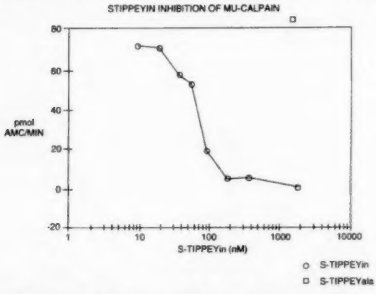
CELL-PERMEABLE PROTEIN INHIBITORS OF CALPAIN

David A. Potter, Brighton, and Paul R. Skolnik, Sharon, both of Mass., assignors to New England Medical Center Hospitals, Inc., Boston, Mass.

Filed Nov. 4, 1997, Appl. No. 964,302

Int. Cl.[7] A61K *38/02;38/55;* **C07K** *2/00;14/81*

U.S. Cl. 514—12 **25 Claims**



1. A method of inhibiting a calpain in a cell, comprising contacting the cell with an effective amount of a fusion protein having a first portion and a second portion, the first portion comprising a signal sequence capable of delivering the fusion protein into the cell, the second portion comprising the sequence Xaa-Xaa-Leu-Gly-Xaa-Xaa-Xaa-Xaa-Thr-Ile-Pro-Pro-Xaa-Tyr-Xaa-Xaa-Leu-Leu-Xaa (SEQ ID NO:18);

wherein:

Xaa at position 1 is Glu, Asp, or Lys;

Xaa at position 2 is Lys, Glu, Ala, or Asn;

Xaa at position 5 is Glu, Lys, or Ile;

Xaa at position 6 is Arg, Lys, or Asp;

Xaa at position 7 is Asp, or Glu;

Xaa at position 8 is Asp, Val, Ser, Gly, or Glu;

Xaa at position 13 is Glu, Lys, or Asp;

Xaa at position 15 is Arg, Lys, or Gln;

Xaa at position 16 is Glu, His, Lys, or Leu; and

Xaa at position 19 is Glu, Asp, Asn, Ala, or Val.

6,015,788

HUMAN NUCLEIC ACID BINDING PROTEIN

Olga Bandman, Mountain View; Janice Au-Young, Berkeley; Phillip R. Hawkins, Mountain View, and Jennifer L. Hillman, San Jose, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Division of application No. 08/698,407, Aug. 15, 1996, Pat. No. 5,856,128. This application Nov. 19, 1998, Appl. No. 195,855.

Int. Cl.[7] A61K *38/00*

U.S. Cl. 514—12 **2 Claims**

1. A substantially purified polypeptide comprising the amino acid sequence of SEQ ID NO:1.

6,015,789

COMBINED USE OF GNRH AGONIST AND ANTAGONIST

Nobuhiro Suzuki, and Shuichi Furuya, both of Tsukuba, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP97/01459, § 371 Date Aug. 14, 1997, § 102(e) Date Aug. 14, 1997, PCT Pub. No. WO97/40846, PCT Pub. Date Nov. 6, 1997

PCT Filed Apr. 25, 1997, Appl. No. 894,317

Claims priority, application Japan, Apr. 30, 1996, 8-109790; May 31, 1996, 8-138873

Int. Cl.[7] A61K *38/09;31/505;31/44*

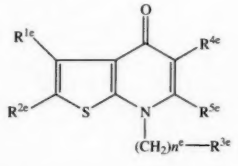
U.S. Cl. 514—15 **22 Claims**

1. A method for treating a sex hormone-dependent disease in a mammal, which comprises administering to said mammal in need of the treatment a compound having luteinizing hormone activity, of the formula:

$$(Pyr)Glu\text{-}R_1\text{-}Trp\text{-}Ser\text{-}R_2\text{-}R_3\text{-}R_4\text{-}Arg\text{-}Pro\text{-}R_5 \quad (I)$$

wherein R_1 is His, Tyr, Trp or p-NH_2-Phe; R_2 is Tyr of Phe; R_3 is Gly or a D-amino acid residue which may optionally be substituted; R_4 is Leu, Ile or Nle; R_5 is a group of the formula: Gly-NH-R_6 wherein R_6 is a hydrogen or an optionally substitued alkyl group or a group of the formula: NH-$R_{6'}$ wherein $R_{6'}$ is a hydrogen, an alkyl group which may optionally be substituted with amino, hydroxy or ureido, in combination with a nonpeptide compound having luteinizing hormone releasing hormone antagonizing activity, (i) of the formula:

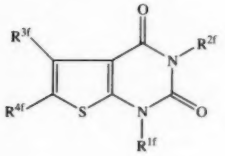
(X)



wherein R^{1e} and R^{2e} are independently a hydrogen atom, or a group bonded through a carbon atom, a nitrogen atom, an oxygen atom or a sulfur atom; R^{3e} is an optionally substituted homo- or hetero-cyclic ring; R^{4e} is a hydrogen atom, a group bonded through

a carbon atom, a nitrogen atom, an oxygen atom or a sulfur atom, or an optionally substituted heterocyclic group; R^{5f} is a hydrogen atom or a group bonded through a carbon atom; and n is an integer of 0 to 3, or a salt thereof, or (ii) of the formula:

(XX)



wherein R^{1f} is (1) a hydrogen atom, (2) a group bonded through a carbon atom or (3) a group of the formula: $—(CH_2)n—R^{1f}$ wherein R^{1f} is a group bonded through a carbon atom or an optionally substituted homo- or hetero-cyclic group and n is an integer of 0 to 3; R^{2f} is a hydrogen atom or a group bonded through a carbon atom; and R^{3f} and R^{4f} are independently a group bonded through a carbon atom, or a salt thereof.

6,015,790

METHODS AND COMPOSITIONS FOR TREATING RHEUMATOID ARTHRITIS

Teresa Barlozzari, Wellesley; Subhashis Banerjee, Shrewsbury, and Andreas Haupt, Northborough, all of Mass., assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 6, 1997, Appl. No. 944,479

Int. Cl.[7] A61K *38/00*

U.S. Cl. 514—17 **11 Claims**

1. A method for the treatment of rheumatoid arthritis in a mammal, comprising administering to said mammal a therapeutically effective amount of a compound of Formula I:

$$R^1R^2N—CHX—CO—A—B—D—(E)_s—(F)_t—(G)_u—K \quad (I)$$

wherein:

R^1 is alkyl, cycloalkyl, alkylsulfonyl, fluoroalkyl, or aminosulfonyl;

R^2 is hydrogen, alkyl, fluoroalkyl or cycloalkyl;

$R^1—N—R^2$ together may be a pyrrolidino or piperidino residue;

A is a valyl, isoleucyl, leucyl, allo-isoleucyl, 2,2-dimethylglycyl, 2-cyclopropylglycyl, 2-cyclopentylglycyl, 3-tert-butylalanyl, 2-tert-butylglycyl, 3-cyclohexylalanyl, 2-ethylglycyl, 2-cyclohexylglycyl, norleucyl or norvalyl residue;

B is a N-alkyl-valyl, -norvalyl, -leucyl, -isoleucyl, -2-tert-butylglycyl, -3-tert-butylalanyl, -2-ethylglycyl, -2-cyclopropylglycyl, - 2-cyclopentylglycyl, -norleucyl or -2-cyclohexylglycyl residue;

D is a prolyl, homoprolyl, hydroxyprolyl, 3,4-dehydroprolyl, 4-fluoroprolyl, 3-methylprolyl, 4-methylprolyl, 5-methylprolyl, azetidine-2-carbonyl, 3,3-dimethylprolyl, 4,4-difluoroprolyl, oxazolidine-4-carbonyl or thiazolidine-4-carbonyl residue;

E is a prolyl, homoprolyl, hydroxyprolyl, 3,4-dehydroprolyl, 4-fluoroprolyl, 3-methylprolyl, 4-methyl prolyl, 5-methylprolyl, azetidine-2-carbonyl, 3,3-dimethylprolyl, 4,4-difluoroprolyl, oxazolidine-4-carbonyl or thiazolidine-4-carbonyl residue;

F and G are independently selected from the group consisting of prolyl, homoprolyl, hydroxyprolyl, thiazolidinyl-4-carbonyl, 1-aminopentyl-1-carbonyl, valyl, 2-tert-butylglycyl, isoleucyl, leucyl, 3-cyclohexylalanyl, phenylalanyl, N-methylphenylalanyl, tetrahydrosioquinolyl-2-histidyl, 1-aminoindyl-1-carbonyl, 3-pyridylalanyl, 2-cyclohexylglycyl, norleucyl, norvalyl, neopentylglycyl, trytophanyl, glycyl, 2,2-dimethylglycyl, alanyl, β-alanyl and 3-naphthylalanyl residues;

X is hydrogen, alkyl, cycloalkyl, $—CH_2$-cyclohexyl or arylalkyl;

s, t and u are independently 0 or 1; and

K is hydroxy, alkoxy, phenoxy, benzyloxy or an amino moiety of the formula $R^5—N—R^6$ wherein:

R^5 is hydrogen; hydroxy; C_{1-7} alkoxy; benzyloxy; phenyloxy; fluorine-substituted or unsubstituted C_{1-7}-linear or branched alkyl; C_{1-12} linear or branched hydroxyalkyl; C_{3-10}-cycloalkyl; unsubstituted benzyl or mono-, di- or tri substituted benzyl, wherein the substituents are independently selected from the group consisting of: CF_3, nitro, C_{1-7} alkylsulfonyl, C_{1-4} alkoxy, phenoxy, benzoxy, halogen, C_{1-4}-alkyl, cyano, hydroxy, $N(CH_3)_2$, COOMe, COOEt, COOiPr, and $COONH_2$;

R^6 is hydrogen; fluorine-substituted or unsubstituted C_{1-12} linear or branched alkyl; C_{1-12} linear or branched hydroxyalkyl; C_{3-10}-cycloalkyl; $—(CH_2)_v—C_{3-7}$-cycloalkyl (v=0,1,2, or 3); norephedryl; norpseudoephedryl; quinolyl; pyrazyl; $—CH_2$-benzimidazolyl; (1)-adamantyl; (2)-adamantyl; $—CH_2$-adamantyl; alpha-methyl-benzyl; alpha-dimethylbenzyl; $—(CH_2)_v$-phenyl (v=0,1,2, or 3) wherein the phenyl group is unsubstituted or mono- or di-substituted and the substituents are independently selected from the group consisting of: CF_3, nitro, C_{1-7} alkylsulfonyl, C_{1-4} alkoxy, phenoxy, benzoxy, halogen, C_{1-4}-alkyl or fused alkyl, cyano, hydroxy, $N(CH_3)_2$, COOMe, COOEt, COOiPr, and $COONH_2$; $—(CH_2)_m$-naphthyl (m=0 or 1); $—(CH_2)_w$-benzhydryl (w=0,1, or 2); biphenyl; picolyl; benzothiazolyl; benzoisothiazolyl; benzopyrazolyl; benzoxazylyl; $—(CH_2)_m$-fluorenyl (m=0 or 1); pyrimidyl; $—(CH_2)_m$-indanyl (m=0 or 1); $—(CH_2CH_2O)_y—CH_3$(y=0,1,2,3,4, or 5); $—(CH_2CH_2O)_y—\ CH_2CH_3$ (y=0,1,2,3,4, or 5); NH-phenyl wherein the phenyl group is unsubstituted or mono- or di-substituted and the substituents are independently selected from the group consisting of: CF_3, nitro, C_{1-7} alkylsulfonyl, C_{1-4} alkoxy, halogen, C_{1-4} alkyl or fused alkyl, cyano, hydroxy, COOMe, COOEt, COOiPr, and $COONH_2$; $—NCH_3—C_6H_5$; $—NH—CH_2—C_6H_5$; $—NCH_3—CH_2—C_6\ H_5$; 5-membered unsubstituted or mono- or di-substituted heteroaryl wherein the substituents are selected from the group consisting of: CF_3, nitro, thiomethyl, thioethyl, C_{3-6}-cycloalkyl, $—CH_2—COOEt$, and C_{3-4}-alkylene group forming a bicyclic system with the heterocycle; phenyl; $—CHR^7$-5-membered heteroaryl wherein the heteroaryl group is unsubstituted or mono- or di-substituted wherein the substituents are independently selected from the group consisting of: CF_3, nitro, cyano, halogen, COOMe, COOEt, COOiPr, $CONH_2$, C_{1-4}-alkyl, C_{1-4}-alkoxy, phenyl, benzyl, naphthyl, and C_{1-7}-alkylsulfonyl; and R^7 is hydrogen, linear or branched C_{1-5} alkyl, benzyl, or R^7 and R^5 together form a group $—(CH_2)_3—$ or $—(CH_2)_4—$

and the salts thereof with physiologically tolerated acids.

6,015,791

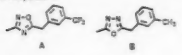
SERINE PROTEASE INHIBITORS-CYCLOHEPTANE DERIVATIVES

Albert Gyorkos, Westminster, Colo., and Lyle W. Spruce, Chula Vista, Calif., assignors to Cortech Inc., Bedminster, N.J.

Continuation-in-part of application No. 08/762,381, Dec. 6, 1996, Pat. No. 5,891,852, which is a continuation-in-part of application No. 08/345,820, Nov. 21, 1994, Pat. No. 5,618,792.
This application Dec. 4, 1997, Appl. No. 984,881.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A61K *31/55;38/05;38/06;* C07K *5/078*
U.S. Cl. 514—18 32 Claims

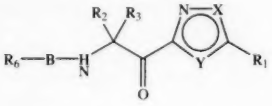
CE#	R	MET	K_i (nM)
2130		B	10.0
2132		A	24.0
2134		B	2.0
2135		A	17
2125		B	5.05
2127		A	33.9

Heterocycles:



A B

1. A compound of the formula:



wherein

X and Y are O, N, or S, provided that at least one of X or Y is N;

R_1 is $(C_5–C_{12})$aryl, $(C_5–C_{12})$arylalkyl or $(C_5–C_{12})$arylalkenyl, optionally comprising one or more heteroatoms selected from N, S and non-peroxide O;

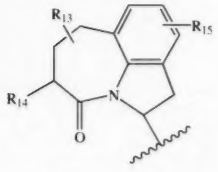
and optionally substituted with alkyl, halo, haloalkyl, amino, alkylamino or dialkylamino;

R_2 and R_3, are independently or together H or alkyl;

B is $-S(O)_2-$ or -C(O)-;

R_6 is

(I)



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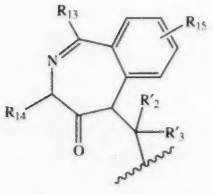

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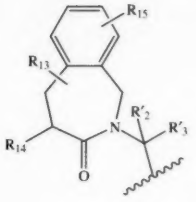

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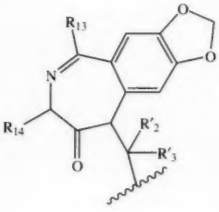

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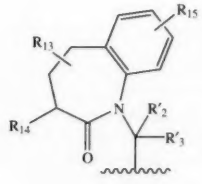

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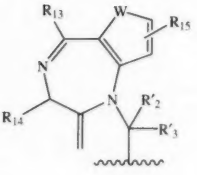


wherein

R'_2 and R'_3 are independently or together H, alkyl, alkylthio, alkylthioalkyl; or cycloalkyl, alkylcycloakyl, $(C_5–C_6)$aryl or $(C_5–C_6)$arylalkyl optionally substituted with guanidine, carboalkoxy, hydroxyl, haloalkyl, alkylthio, alkylguanidine, dialkylguanidine or amidine;

R_{13} is H, alkyl, halo, alkoxy, carboalkoxy, cycloalkoxy, carboxyl, alkylthio, amino, alkylamino, dialkylamino, or aryl, arylalkyl, cycloalkyl, alkylcycloalkyl, fused aryl-cycloalkyl or alkyl fused aryl-cycloalkyl optionally comprising 1 or more heteroatoms selected from O, N and S, and optionally substituted with halo or alkyl;

R_{14} is H, alkyl, alkenyl, amino, alkylamino, dialkylamino; or aryl, arylalkyl, cycloalkyl, alkylcycloalkyl, fused aryl-cycloalkyl or alkyl fused aryl-cycloalkyl, aryloxycarboxamide or arylalkyloxycarboxamide optionally comprising 1 or more heteroatoms selected from N, O and S and optionally substituted with alkyl, halo, alkoxy, amino, alkylamino, dialkylamino, carboxy, alkenyl, alkynyl, haloalkoxy, carboalkoxy, alkylcarboxamide, aryl, arylalkyl, arylcarboxamide, arylalkylcarboxamide, alkylthio or haloalkylthio;

R_{15} is H, alkyl, halo, alkoxy, carboalkoxy, carboxyl, alkylthio, amino, alkylamino, dialkylamino, or aryl, arylalkyl, cycloalkyl, alkylcycloalkyl, fused aryl-cycloalkyl or alkyl fused aryl-cycloalkyl optionally comprising 1 or more heteroatoms selected from O, N, or S; and

W is C, O, S or N.

6,015,792

SPECIFIC EATABLE TASTE MODIFIERS

Robert J. Kurtz, New York, N.Y., and William D. Fuller, San Diego, Calif., assignors to Bioresearch, Inc., Alexandria, Va.

Division of application No. 08/877,472, Jun. 17, 1997, which is a division of application No. 08/462,265, Jun. 5, 1995, Pat. No. 5,700,792, which is a division of application No. 08/451,063, May 25, 1995, Pat. No. 5,637,618, which is a continuation of application No. 08/067,537, May 26, 1993, abandoned, which is a continuation-in-part of application No. PCT/US92/10179, Nov. 24, 1992, and a continuation-in-part of application No. 07/799,207, Nov. 27, 1991, abandoned, which is a continuation-in-part of application No. 07/531,388, Jun. 1, 1990, Pat. No. 5,232,735. This application Mar. 13, 1998, Appl. No. 42,148.

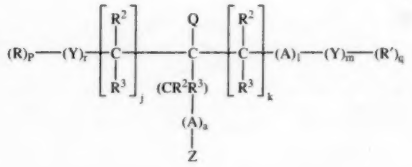
This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *38/05;* **A01N** *37/14;37/28;* **C07C** *229/08;205/02*

U.S. Cl. 514—19 **40 Claims**

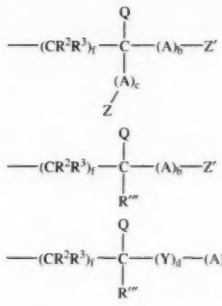
1. An eatable composition comprising a sweetener which imparts an undesirable taste to the eatable, and at least one tastand in a substantially tasteless amount of from about 0.0000001 to about 300% by weight, based on the weight of the eatable, which amount is sufficient to reduce said undesirable taste, said tastand being selected from the group consisting of compounds which are substantially tasteless in the amount used and have the structure V-1:

V-1



wherein a, r, l, and m are 0 or 1; n, j, and k are 0, 1, 2, or 3; each R^2 and R^3, which may be the same or different, is independently selected from the group consisting of H, alkyl, substituted alkyl, alkylene, substituted alkylene, branched alkyl, substituted branched alkyl, branched alkylene, substituted branched alkylene, aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, acyl, substituted acyl, benzoyl, substituted benzoyl, alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, trifluoromethyl, halogen, cyano, heterocyclic, substituted heterocyclic, polycyclic, and substituted polycyclic; each Y, which may be the same or different, is independently selected from the group consisting of N, O, and S; when r is 1 and Y is N, p is 2 or 3; when m is 1 and Y is N, q is 2 or 3; when r is 1 and Y is O, p is 1; when m is 1 and Y is O, q is 1; when r is 1 and Y is S, p is 1 or 2; when m is 1 and Y is S, q is 1 or 2; A is selected from the group consisting of H, C═O, O═S═O, S═O, O═P(H)OH, O═P$(OH)_2$, and O═B(H)OH; Q is selected from the group consisting of H, alkyl, substituted alkyl, alkylene, substituted alkylene, branched alkyl, substituted branched alkyl, branched alkylene, substituted branched alkylene, aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, acyl, substituted acyl, benzoyl, substituted benzoyl, alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, trifluoromethyl, halogen, cyano, heterocyclic, substituted heterocyclic, polycyclic, and substituted polycyclic; each R, which may be the same or different when p>1, and each R', which may be the same or different when q>1, is independently selected from the group consisting of H, alkyl, substituted alkyl, dialkyl, substituted dialkyl, aralkyl, substituted aralkyl, aryl, substituted aryl, diaryl, substituted diaryl, acyl, substituted acyl, cycloalkyl, substituted cycloalkyl, benzoyl, substituted benzoyl, trifluoroacetyl, alkyloxycarbonyl, substituted alkyloxycarbonyl, aryloxycarbonyl, substituted aryloxycarbonyl, alkylaminocarbonyl, substituted alkylaminocarbonyl, arylaminocarbonyl, substituted arylaminocarbonyl, amidines, substituted amidines, alkylamidines, substituted alkylamidines, arylamidines, substituted arylamidines, monosaccharide, substituted monosaccharide, disaccharide, substituted disaccharide, trisaccharide, substituted trisaccharide, oligosaccharide, substituted oligosaccharide, phosphorylated saccharides, substituted phosphorylated saccharides, arylacyl, substituted arylacyl, alkylene, substituted alkylene, heterocyclic, substituted heterocyclic, polycyclic, substituted polycyclic and the following three structures V-2:

V-2



wherein b, c and d are 0 or 1; f is 0, 1, 2, 3, 4, 5., 6, 7, 8, 9, 10; each Y as is defined above; when d is 1 and b is 0 and Y is N, e is 2 or 3; when d is 1 and b is 0 and Y is O, e is 1; when d is 1 and b is 0 and Y is S, e is 1 or 2; A is as defined above; Q is selected from the group consisting of H, alkyl, substituted alkyl, alkylene, substituted alkylene, branched alkyl, substituted branched alkyl, branched alkylene, substituted branched alkylene, aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, acyl, substituted acyl, benzoyl, substituted benzoyl, alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, trifluoromethyl, halogen, cyano, heterocyclic, substituted heterocyclic, polycyclic, substituted polycyclic; R''' and Q together may form a cyclic structure; any of the R^3's and Q together may form a cyclic structure; any of the R^3's and R'''s together may form a cyclic structure; Z and Z' may be the same or different and are independently selected from OH, $—O^-X^+$, OR'', NH_2, NHR'', $N(R'')_2$; R'' is selected from alkyl, branched alkyl, aryl, aralkyl, alkaryl, cycloalkyl, substituted alkyl, substituted cycloalkyl substituted aryl, substituted aralkyl, substituted alkaryl; R''' is selected from alkyl, branched alkyl, aryl, aralkyl, alkaryl, cycloalkyl, substituted alkyl, substituted cycloalkyl, substituted aryl, substituted aralkyl, substituted alkaryl, and an amino acid side chain; where CH—CH or CH_2—CH_2 bonds exist the level of unsaturation may be increased by removing one or more hydrogen atoms from each carbon atom participating in the CH—CH or CH_2—CH_2 bonds; X^+ is selected from H^+ or a physiologically acceptable cation; and physiologically acceptable salts of any of the foregoing compounds.

6,015,793

USE OF TAGATOSE TO ENHANCE KEY BLOOD FACTORS

Gilbert V. Levin, Annapolis, Md., assignor to Biospherics Incorporated, Beltsville, Md.

Filed Apr. 26, 1999, Appl. No. 299,023

Int. Cl.[7] **A61K** *31/70*

U.S. Cl. 514—23 **9 Claims**

1. A method for treating anemia or hemophilia in a mammal comprising administering to a mammal in need of such treatment an efficacious amount of tagatose.

6,015,794

TRANS-SPLICING RIBOZYMES

James Haseloff, Cambridge, and Howard M. Goodman, Newton, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Division of application No. 08/090,192, Nov. 17, 1993, and a continuation of application No. PCT/US92/00278, Jan. 16, 1992, which is a continuation-in-part of application No. 07/642,333, Jan. 17, 1991, abandoned. This application Jun. 6, 1995, Appl. No. 470,349.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12Q *1/68;* C07H *21/04;* A61K *48/00*

U.S. Cl. 514—44 40 Claims

1. A first polynucleotide molecule, said polynucleotide molecule comprising a sequence encoding a trans-splicing ribozyme, said ribozyme being capable of trans-splicing a desired RNA sequence into a target RNA sequence in vitro or in vivo, said ribozyme comprising sequences complementary to said target mRNA sequence.

6,015,795

BOVINE VIRAL DIARRHEA VIRUS II VACCINE AND METHOD OF IMMUNIZATION

Jan van den Hurk, Saskatoon, and Peter Tijssen, Pointe Claire, both of Canada, assignors to Biostar, Inc., Saskatoon, Canada

Division of application No. 08/445,746, May 22, 1995, Pat. No. 5,709,865, which is a continuation-in-part of application No. 08/337,618, Nov. 10, 1994, abandoned. This application Jan. 19, 1998, Appl. No. 8,722.

Int. Cl.[7] A61K *48/00;* C07H *21/04*

U.S. Cl. 514—44 2 Claims

1. An immunogenic composition for generating an immune response in a cow against an infection caused by bovine viral diarrhea virus group II (BVDV-II), comprising

a chimeric gene operatively coding for a BVDV-II gp53 polypeptide antigen, and

a pharmacologically acceptable vehicle,

wherein said gene is effective to express said polypeptide antigen in said cow.

6,015,796

METHOD FOR TREATING AIDS

Fujio Suzuki; Hidetaka Sasaki, and Makiko Kobayashi, all of Galveston, Tex., assignors to Zeria Pharmaceutical Co., Ltd., and Natsu Maruyama, both of Tokyo, Japan

Filed Mar. 11, 1998, Appl. No. 38,041

Int. Cl.[7] A61K *31/70*

U.S. Cl. 514—45 19 Claims

1. A method of treating AIDS, comprising administering to an HIV-infected patient an effective amount of

(a) a composition comprising a polysaccharide produced by a hot aqueous solvent extraction of tubercle bacillus, wherein the polysaccharide is comprised of arabinose, mannose and glucose residues, and

(b) a nucleoside anti-HIV agent.

14. A composition, comprising:

(a) a composition comprising a polysaccharide produced by a hot aqueous solvent extraction of tubercle bacillus, wherein the polysaccharide is comprised of arabinose, mannose and glucose residues, and

(b) a nucleoside anti-HIV agent.

6,015,797

ADENOSINERGIC AGONIST CONTAINING PHARMACEUTICAL COMPOSITION WITH ANALGESIC ACTIVITY

Francoise Camborde, Rueil Malmaison; Alix Cloarec, Triel Sur Siene, both of France; Timur Gungor, Brandon Farms, N.J., and Jean-Marie Teulon, La Celle Saint Cloud, France, assignors to Laboratoires UPSA, Agen, France

Filed Dec. 7, 1998, Appl. No. 206,536

Claims priority, application France, Dec. 11, 1997, 97/15685

Int. Cl.[7] A61K *31/70;31/55;31/44*

U.S. Cl. 514—46 6 Claims

1. A pharmaceutical composition comprising, as active principle, a combination of an adenosinergic agonist and a compound selected from the group consisting of, a benzodiazepine and an N-Methyl-D-aspartic acid (NMDA) antagonist and a pharmaceutically acceptable carrier or excipient wherein the adenosinergic agonist compound is selected from the group consisting of N-cyclopropyl-1-deoxy-1-[6-[[2-[1-[2-(1-piperidinyl) ethyl] ethyl]-1H-indol-3-yl] ethyl] amino]-9H-purin-9-yl]β-D-ribofuranuronamide and N-cyclopropyl-1-deoxy-1-[6-[[2-[1-[(2,5-dimethylphenyl) methyl]-5-methyl-1H-indol-3-yl] ethyl] amino]-9H-purin-9-yl] β-D-ribofuranuronamide.

6,015,798

METHOD FOR REDUCING THE DAMAGING EFFECTS OF RADIATION THERAPY ON ANIMAL SKIN AND MUCOSA

Gregory K. Ogilvie, Ft. Collins, Colo.; Deborah J. Davenport, Lecompton, Kans.; Kathy L. Gross, Topeka, Kans., and Michael S. Hand, Maple Hill, Kans., assignors to Colgate Palmolive Company, New York, N.Y., and Colorado State University Research Foundation, Ft. Collins, Colo.

Continuation-in-part of application No. 08/544,421, Oct. 10, 1995, Pat. No. 5,776,913. This application Jun. 29, 1998, Appl. No. 106,295.

Int. Cl.[7] A61K *31/715;31/685;31/20;31/195*

U.S. Cl. 514—57 5 Claims

1. A method for mitigating the damaging effects to normal skin and mucosa cells of a pet animal undergoing radiation therapy of malignant neoplasia comprising preparing a nutritionally balanced pet food composition comprising omega-6 polyunsaturated fatty acids, supplementing the food composition with a mixture of omega-3 polyunsaturated fatty acids and arginine exposing the animal to radiation therapy and feeding the food composition to the animal at least during the period of time during which the animal is exposed to the radiation whereby radiation damage to the animals normal cells is mitigated.

6,015,799

DEXTRIN SULFATES AND ANTI HIV-1 AGENTS AND COMPOSITION THEREOF

Donald Selwyn Davies, Beaconsfield, United Kingdom, assignor to M.L. Laboratories PLC, Liverpool, United Kingdom

Continuation of application No. 08/030,227, filed as application No. PCT/GB91/01628, Sep. 23, 1991, Pat. No. 5,439,892. This application Mar. 24, 1995, Appl. No. 410,067.

Claims priority, application United Kingdom, Sep. 25, 1990, 9020861

Int. Cl.[7] A61K *31/70*

U.S. Cl. 514—58 13 Claims

1. A method of treatment of a human or animal subject against the HIV-1 virus or an HIV-1 related virus, comprising administering to the subject a pharmaceutically effective amount of an agent against HIV-1 and HIV-1 related viruses, comprising dextrin sulphate containing at most two sulphate groups per glucose unit.

6,015,800

SUBSTITUTED QUINOXALINE-2-ONES AS GLUTAMATE RECEPTOR ANTAGONISTS

Sham Shridhar Nikam, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

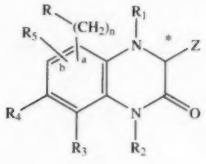
Provisional application No. 60/057,478, Sep. 3, 1997. This application May 15, 1998, Appl. No. 79,668.

Int. Cl.[7] **A61K** *31/495*; **C07D** *241/44*;*403/10*

U.S. Cl. 514—85 **4 Claims**

1. A compound of formula

I



or a pharmaceutically acceptable salt thereof wherein

* is R, S, or RS(±);

R is a secondary or tertiary amine of the formula

wherein R_{11} and R_{12} are each independently,

hydrogen,

methyl,

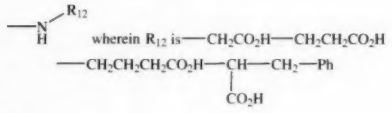
ethyl,

propyl,

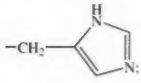
butyl, or

cyclohexyl;

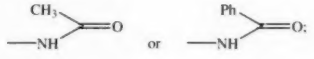
amino acid deserve of the formula



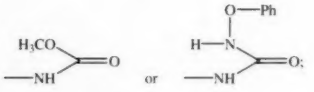
and



amide of the formula

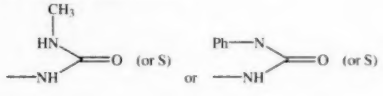


carbamate,



or

urea or a thiourea, of the formula



n is an integer of from 1 to 4;

R_1 is hydrogen,

alkyl,

carboxyalkyl,

phosphoroalkyl, or

phosphonoalkyl;

R_2 is hydrogen,

hydroxy, or

amino;

R_3 and R_4 are each independently

hydrogen,

alkyl,

cycloalkyl of from 5 to 8 atoms,

halogen,

haloalkyl,

nitro,

cyano,

SO_2CF_3,

$C(O)R_6$,

$(CH_2)_mSO_2R_6$,

$(CH_2)_mCO_2R_9$ wherein R_9 is hydrogen, alkyl, aralkyl, or cycloalkyl,

$(CH_2)_mCONR_7R_8$,

$(CH_2)_mSO_2NR_7R_8$, or

$NHCOR_6$ wherein m is an integer of from 0 to 4, R_6 is hydroxy,

alkyl, haloalkyl, aryl, or aralkyl, and R_7 and R_8 are each independently hydrogen, alkyl, aralkyl, or aryl;

R_5 is hydrogen,

alkyl,

alkynyl,

halogen,

haloalkyl,

aryl,

aralkyl,

heteroaryl,

nitro,

cyano,

SO_2CF_3,

$C(O)R_6$,

$(CH_2)_mCO_2R_9$,

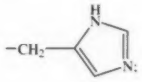
$(CH_2)_mCONR_7R_8$,

$(CH_2)_mSO_2R_6$,

$(CH_2)_mSO_2NR_7R_8$ or

$NHCOR_6$ wherein m, R_7, and R_8 are as defined above;

Z is the side-chain of an amino acid selected from $—CH_3$, $—CH_2OH$, $—CH_2CO_2H$, $—CH_2SH$ and



R_5 and the $—(CH_2)_n—R$ side chain may be at the a or b position on the ring.

6,015,801

METHOD FOR INHIBITING BONE RESORPTION

Anastasia G. Daifotis; A. John Yates, both of Westfield, and Arthur C. Santora, II, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of application No. PCT/US98/14796, Jul. 17, 1998, Provisional application No. 60/053,535, Jul. 23, 1997, Provisional application No. 60/053,351, Jul. 22, 1997. This application Aug. 14, 1998, Appl. No. 134,215.

Int. Cl.[7] **A61K** *31/66*

U.S. Cl. 514—108 **59 Claims**

1. A method for treating a condition or disease state in a mammal, said disease state or condition selected from the group consisting of Paget's disease, abnormally increased bone turnover,

periodontal disease, tooth loss, bone fractures, metastatic bone disease, hypercalcemia of malignancy, and multiple myeloma, said method comprising orally administering to said mammal a pharmaceutically effective amount of a unit dosage of a bisphosphonate according to a continuous schedule having a dosing interval selected from the group consisting of once-weekly dosing, twice-weekly dosing, biweekly dosing, and twice-monthly dosing.

6,015,802

SYNERGISTIC FUNGICIDAL COMPOSITION COMPRISING A COMPOUND ANALOGOUS TO STROBILURIN

Patrice Duvert, Lyons, France, assignor to Rhone-Poulenc Agrochimie, Lyon, France

PCT No. PCT/FR96/01155, § 371 Date May 13, 1998, § 102(e) Date May 13, 1998, PCT Pub. No. WO97/03563, PCT Pub. Date Feb. 6, 1997

PCT Filed Jul. 23, 1996, Appl. No. 983,625

Claims priority, application France, Jul. 24, 1995, 95 09183

Int. Cl.[7] A01N *43/54;57/18;59/26*

U.S. Cl. 514—141 **32 Claims**

1. A fungicidal composition comprising a synergistic fungicidally effective amount of a compound A which is methyl (E)-2-{2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate and a compound B which is phosphorous acid, a metal phosphite or an alkali metal or alkaline-earth metal salt of phosphorous acid, the A/B ratio by weight being from 0.004 to 1.

6,015,803

ANTIBIOTIC TREATMENT OF AGE-RELATED MACULAR DEGENERATION

Emil Wirostko, 34 Old Mine Rd., Lebanon, N.J. 08833

Filed May 5, 1998, Appl. No. 72,521

Int. Cl.[7] A61K *31/00*

U.S. Cl. 514—152 **6 Claims**

1. A method for the treatment of age-related macular degeneration, comprising systemically administering a therapeutically effective but safe amount of tetracycline for a therapeutically effective period to a patient in need thereof.

6,015,804

METHOD OF USING TETRACYCLINE COMPOUNDS TO ENHANCE INTERLEUKIN-10 PRODUCTION

Lorne M. Golub, Smithtown; Christopher T. Ritchlin, Canandaigua; Robert A. Greenwald, Melville; Sally Haas-Smith, Penfield; Susan A. Moak, Bayside, and Hsi-Ming Lee, Setauket, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, and University of Rochester, Rochester, both of N.Y.

Filed Sep. 11, 1998, Appl. No. 151,534

Int. Cl.[7] A61K *31/65*

U.S. Cl. 514—152 **21 Claims**

1. A method for enhancing endogenous interleukin-10 production in mammalian cells or tissues, which comprises administering to said cells an effective amount of a tetracycline derivative.

6,015,805

17β-NITRO-11β-ARYLISTEROIDS AND THEIR DERIVATIVES HAVING AGONIST OR ANTAGONIST HORMONAL PROPERTIES

C. Edgar Cook, Staunton, Va.; John A. Kepler, Raleigh, N.C.; Rupa S. Shetty; Gary S. Bartley, both of Durham, N.C., and David Yue-wei Lee, Chapel Hill, N.C., assignors to Research Triangle Research North Carolina, Research Triangle Park, N.C.

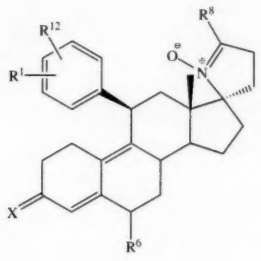
Division of application No. 09/086,674, May 29, 1998, Pat. No. 5,962,444. This application May 25, 1999, Appl. No. 317,945.

Int. Cl.[7] A61K *31/58;* **C07J** *43/00*

U.S. Cl. 514—176 **12 Claims**

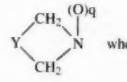
1. A hormonal or antihormonal steroid compound of structure II,

(II)



wherein

R^1 is $(R^2\ R^3\ N(O)_r)$—, where r is 0 or 1 and R^2 and R^3 are each independently H, C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{2-6} alkenyl or C_{2-6} alkynyl, any of which may be optionally substituted; or

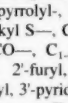
R^1 is  where q is 0 or 1,

Y is $—(CH_2)_m—$ where m is an integer of 0 to 5, or Y is $—CH_2)_n—Z—(CH_2)_p—$ where n is an integer of 0 to 2, p is an integer of 0 to 2, and Z is a heteroatom (optionally substituted) and where the CH_2 groups may be optionally substituted; or

R^1 is N-imidazolyl-, N-pyrrolyl-, halo-, HO—, CF_3SO_2O—, C_{1-6} alkyl O—, C_{1-6} alkyl S—, C_{1-6} alkyl S(O)—, C_{1-6} alkyl $S(O_2)$—, C_{1-6} alkyl CO—, C_{1-6} alkyl CH(OH)—, NC—, HCC—, C_6H_5CC—, 2'-furyl, 3'-turyl-, (2'-thiophenyl, 3'-thiophenyl-, 2'-pyridyl, 3'-pyridyl, 4'-pyridyl-, 2'-thiazolyl-, 2'-N-methylimidazolyl-, 5'-pyrimidinyl-, C_6H_5—, $H_2C{=}CH$—, C_{1-6} alkyl or $MeC(=CH_2)$—; and

R^{12} is H or halo; or

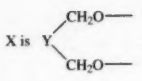
R^1 and R^{12} combine to form a ring



where W is CH_2, CH, NH, N, O, or S, and R^4 is H or C_{1-6} alkyl; and

X is O or NOR^5, where R^5 is H or C_{1-6} alkyl, C_{3-8} cycloalkyl, C_2-6 alkenyl, C_{2-6} alkynyl, C_{6-12} aryl, or heteroaryl, any of which may be optionally substituted; or

X is (H, H), (H, OH), (H, $OSi(C_{1-6}$ alkyl$)_3$), or (H, $OCOR^5$), where R^5 is C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{6-12} aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl or heteroaralkynyl, any of which may be optionally substituted; or



where Y is $-(CH_2)_m-$ where m is an integer of 0 to 3, or Y is $-(CH_2)_n-Z-(CH_2)_p-$ where n is an integer of 0 to 2, p is an integer of 0 to 2 and Z is a heteroatom (optionally substituted) or Z is a carbon atom substituted with one or two C_{1-6} alkyl groups;

R^6 is H, C_{1-6} alkyl, or halogen; and

R^8 is H, C_{1-6} alkyl, C_{2-6} alkenyl, or C_{2-6} alkynyl, C_{3-8} cycloalkyl, C_{6-12} aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl or heteroaralkynyl, any of which may be optionally substituted, and pharmaceutically acceptable salts thereof.

6,015,806

ANTIANDROGENS

Fernand Labrie; Yves Merand, and Shankar M. Singh, all of Ste-Foy, Canada, assignors to Endorecherche, Quebec, Canada

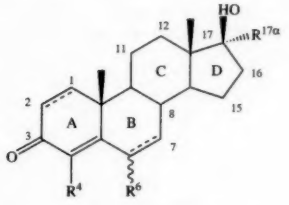
Division of application No. 08/060,612, May 17, 1993, which is a continuation-in-part of application No. 08/196,332, Feb. 14, 1994, Pat. No. 5,494,914, which is a division of application No. 07/886,961, May 21, 1992, abandoned. This application Jun. 7, 1995, Appl. No. 478,973.

Int. Cl.[7] **A61K** *31/56*

U.S. Cl. 514—178 **7 Claims**

1. A method of treating or reducing the risk of acquiring a condition selected from the group consisting of acne, seborrhea, comprising administering to a patient in need of such treatment or reduction a therapeutically effective amount of an antiandrogenic compound of the molecular formula:

I



wherein the dotted lines are optional π bonds;

wherein R^4 is —H or $—CH_3$;

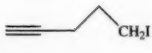
wherein R^6 is —H, $—CH_3$, $—CH_2CH_3$ or halogen, but is hydrogen when the optional π bond at 6,7 is present;

and wherein $R_{17\alpha}$ is selected from the group consisting of:

A) a halogenated unsaturated hydrocarbon moiety having at least one halogen atom that is separated from said D-ring by at least 3 intervening atoms, and having no carbon atom separated from said D-ring by more than four intervening atoms; and

B) a haloalkyl moiety having at least one halogen atom separated from said D-ring by at least three intervening atoms and having no carbon atom separated from said D-ring by more than 4 intervening atoms;

provided that $R^{17\alpha}$ is not



CH_2X when R^4 or R^6 are both hydrogen (x being halogen).

6,015,807

PROTEIN KINASE C INHIBITOR

Gary Lowell Engel, Greenwood; Nagy Alphonse Farid, Lebanon; Margaret Mary Faul, Zionsville; Michael Robert Jirousek; Lori Ann Richardson, both of Indianapolis, and Leonard Larry Winneroski, Jr., Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

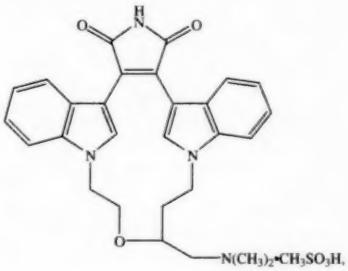
Continuation of application No. 08/749,607, Nov. 18, 1996, Pat. No. 5,710,145, Provisional application No. 60/006,970, Nov. 20, 1995. This application Nov. 7, 1997, Appl. No. 966,081.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A01N** *43/00;55/02;* **C07D** *267/22*

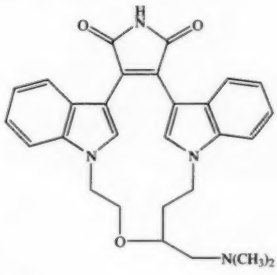
U.S. Cl. 514—183 **3 Claims**

1. A process for preparing a salt of the formula



or solvates thereof,

which comprises reacting a compound formula



with methanesulfonic acid in acetone-water.

6,015,808

SYNTHESIS OF PHARMACEUTICAL COMPOSITIONS WITH LACTAMS AND β-LACTAMS/OXO THIA AZABICYCLO COMPOUNDS

Mandayam Jeersannidhi Thirumalachar, and Mandayam Jeersannidhi Narasimhan, Jr., both of P.O. Box 506, Locust St., Walnut Creek, Calif. 94596

Continuation of application No. 08/109,353, Aug. 20, 1993, abandoned. This application Aug. 22, 1995, Appl. No. 517,964.

Int. Cl.[7] **A61K** *31/43;* **C12P** *17/00;* **C07D** *499/00*

U.S. Cl. 514—192 **6 Claims**

1. A method for producing a single entity pharmaceutical composition consisting essentially of a biologically active parent compound having terminal amino groups which has been reacted in vitro, with a β-lactam compound, comprising the steps of:

(a) dissolving said biologically active parent compound in a polar solvent to form a solution;

(b) adding a β-lactam compound to said solution to the point of saturation;

(c) incubating said solution at room temperature or lower for six to twelve hours, during which said pharmaceutical composition is formed, followed by centrifuging or filtering said solution;

(d) evaporating said solution to dryness to remove said polar solvent, whereby a solid material, which is said pharmaceutical composition, is left behind;

(e) dissolving said solid material in a differential, polar solvent, to remove unreacted or excess of said biologically active parent compound or said β-lactam compound, followed by centrifuging or filtering;

(f) further after step (e), the said pharmaceutical composition is washed with washing solvent to obtain the single entity pharmaceutical composition.

6,015,809

PHOTOCYCLIZED RAPAMYCIN

Tianmin Zhu, Monroe, N.Y., and Hyuk-Koo Lee, San Jose, Calif., assignors to American Home Products Corporation, Madison, N.J.

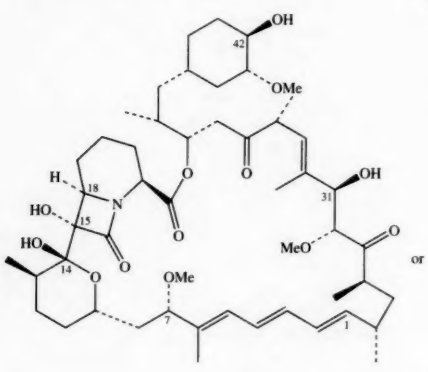
Provisional application No. 60/113,662, Aug. 17, 1998. This application Aug. 16, 1999, Appl. No. 374,654.

Int. Cl.[7] **C07D** *223/00;267/22;* **A61K** *31/395;31/44*

U.S. Cl. 514—210 **4 Claims**

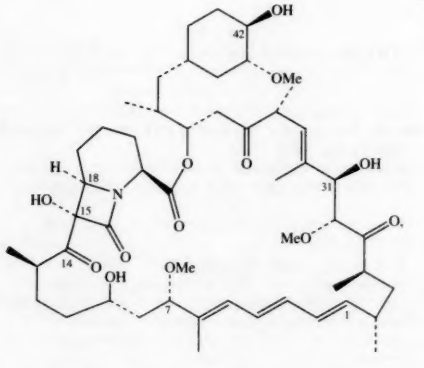
1. A compound of the structure

I



or

II



or a 31- and/or 42-ester or ether thereof.

6,015,810

AQUEOUS OPHTHALMIC SOLUTION CONTAINING APAFANT AS ACTIVE INGREDIENT

Syogo Miyagi; Mitsuaki Kuwano, and Noriyuki Kunou, all of Osaka, Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP96/02933, § 371 Date Apr. 8, 1998, § 102(e) Date Apr. 8, 1998, PCT Pub. No. WO97/13517, PCT Pub. Date Apr. 17, 1997

PCT Filed Oct. 9, 1996, Appl. No. 51,377

Claims priority, application Japan, Oct. 9, 1995, 7-261337

Int. Cl.[7] **A67K** *31/55*

U.S. Cl. 514—220 **32 Claims**

1. A stable aqueous ophthalmic solution comprising apafant and an additive, said additive being in an amount sufficient to adjust the ionic strength of the solution to 0.05 or below.

6,015,811

ANTITUMOR CHRYSENE DERIVATIVES

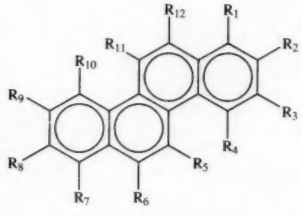
Frederick F. Becker, Houston, and Bimal K. Banik, Missouri City, both of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Oct. 27, 1998, Appl. No. 179,513

Int. Cl.[7] **A61K** *31/39;* **C07D** *295/03*

U.S. Cl. 514—227.5 **32 Claims**

1. A compound having the formula



or a salt thereof;

where at least one of R_1–R_{12} is —$R_{13}Z$, where R_{13} is a substituted or unsubstituted amino or amido group having from 1–12 carbon atoms, and Z is a substituted or unsubstituted heterocyclic group having from 1–12 carbon atoms; and

where the remainder of R_1–R_{12} are independently selected from the group consisting of hydrogen, substituted or unsubstituted amino or amido groups having from 1–12 carbon atoms, nitro, and substituted or unsubstituted hydrocarbyl groups having from 1–12 carbon atoms.

6,015,812

N-(ARYLSULPHONYL)AMINO ACID DERIVATIVES HAVING BRADYKININ RECEPTOR AFFINITY

Bernard Ferrari, Les Matelles; Jean Gougat, Grabels; Claude Muneaux; Yvette Muneaux, both of Les Matelles; Pierre Perreaut, St. Clement de Riviere, and Claudine Planchenault, St. Georges d'Orques, all of France, assignors to Sanofi-Synthelabo, Paris, France

PCT No. PCT/FR97/00026, § 371 Date Jul. 2, 1998, § 102(e) Date Jul. 2, 1998, PCT Pub. No. WO97/25315, PCT Pub. Date Jul. 17, 1997

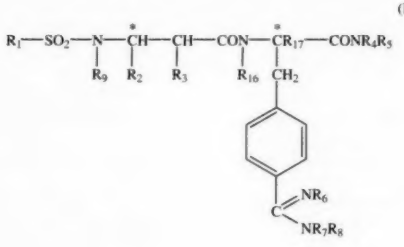
PCT Filed Jan. 7, 1997, Appl. No. 101,214

Claims priority, application France, Jan. 11, 1996, 96 00269

Int. Cl.[7] **A61K** *31/18;31/535;* **C07D** *233/26;413/12*

U.S. Cl. 514—235.8 **32 Claims**

1. A compound of formula:



(I)

in which:

R_1 is a phenyl, a naphthyl, or a tetrahydronaphthyl, the said rigs being unsubstituted or substituted one or more times with R_{10};

R_2 is a phenyl which is unsubstituted or substituted one or more times with R_{11}, a phenyl(C_1–C_4)alkyl which is unsubstituted or substituted one or more times on the phenyl with R_{11}, a naphthyl which is unsubstituted or substituted one or more times with R_{11}, a cyclohexyl which is unsubstituted or substituted one or more times with R_{11};

R_3 is hydrogen or a hydroxyl;

R_4 and R_5 are each independently hydrogen or a (C_1–C_4)alkyl;

or R_4 and R_5 together with the nitrogen atom to which they are attached, constitute a heterocyclic radical chosen from 1-pyrrolidinyl, 1-piperidyl, perhydro-1-azepinyl, 4-morpholinyl, 4-oxo-1-piperidyl, dihydro-1-pyrrolyl or dihydro-2-imidazolyl, the said heterocyclic radicals being unsubstituted or substituted one or more times with R_{13},

R_6 is hydrogen and R_6 can also be R_8 when R_7 is hydrogen;

R_7 is hydrogen or a (C_1–C_4)alkyl;

R_8 is hydrogen; a benzyl which is unsubstituted or substituted on the phenyl one or more times with R_{13}; or a group ZR_{14};

or R_7 and R_8, together with the nitrogen atom to which they are attached, constitute a heterocyclic radical chosen from 1-pyrrolidinyl, 1-piperidyl, 1-perhydro-1-azepinyl, 4-morpholinyl, tetrahydro-2-pyrimidinyl, 1-piperazinyl or 1-piperazinyl substituted in position 4 with a (C_1–C_4)alkyl or a benzyl;

or, when R_7 is hydrogen, R_6 and R_8 are linked together to form a (C_2–C_4)alkylene which is unsubstituted or substituted one or more times with a (C_1–C_4)alkyl;

R_9 is hydrogen, a (C_1–C_4)alkyl or a phenyl(C_1–C_4)alkyl which is unsubstituted or substituted on the phenyl one or more times with R_{11};

R_{10} is a halogen, a (C_1–C_4)alkyl, a (C_1–C_4)alkoxy, a hydroxyl, an amino, a (C_1–C_4)alkylamino or a di(C_1–C_4)alkylamino;

R_{11} is a halogen, a (C_1–C_4)alkyl, a trifluoromethyl, a phenyl, a hydroxyl, a (C_1–C_4)alkoxy or a benzyloxy;

or R_{11} is in the ortho position to the phenyl representing R_2 and forms with R_3 a methylene group or an ethylene group;

or R_{11} is in the ortho position to the phenyl representing $R_2$and forms with R_9 a methylene group or an ethylene group;

R_{12} is a halogen, a (C_1–C_4)alkyl, a hydroxyl, a (C_1–C_4)alkoxy, a benzyloxy, an oxo, a phenyl, an acetyloxy or a trifluoroacetyloxy;

R_{13} is a (C_1–C_4)alkyl, a halogen or a hydroxyl;

R_{14} is a methyl, an amino, a (C_1–C_4)alkylamino, a di(C_1–C_4)alkylamino, a tri(C_1– C_4)alkylammonium, an amidino, a (C_1–C_4)alkylamidino, a guanidino, a (C_1–C_4)alkylguanidino, a hydroxyl, a (C_1–C_4)alkoxy, a (C_1–C_4)alkoxycarbonyl, a group -AlkN(R_{15})Alk'N(R'_{15})$_2$, or a heterocyclic radical chosen from 1-pyrrolidinyl, 1-piperidyl, perhydro-1-azepinyl, pyridyl, imidazolyl, dihydroimidazolyl, imidazolidinyl, pyrimidinyl and indolyl;

R_{15} and R'_{15} are, independently of each other, hydrogen or a (C_1–C_4)alkyl;

R_{16} is hydrogen or a methyl, or R_{16} forms with R_9 a methylene group;

R_{17} is hydrogen or a methyl;

Alk and Alk' are, independently of each other, a (C_1–C_4)alkylene;

Z is a (C_2–C_{12})alkylene or a (C_1–C_6)alkylene which is interrupted or substituted with a (C_5–C_7)cycloalkyl or with a phenyl,

C* is an asymmetric carbon atom;

as well as the salts thereof with inorganic or organic acids.

6,015,813

HETEROCYCLIC COMPOUNDS AND THEIR PREPARATION AND USE

Lone Jeppesen, Virum, and Per Sauerberg, Farum, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

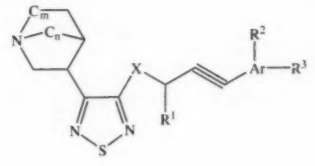
Provisional application No. 60/044,242, Apr. 22, 1997, Provisional application No. 60/062,657, Oct. 8, 1997. This application Apr. 8, 1998, Appl. No. 57,207.

Claims priority, application Denmark, Apr. 22, 1997, 0455/97; Sep. 29, 1997, 1114/97

Int. Cl.[7] **A61K** *31/505;31/445;* **C07D** *417/14*

U.S. Cl. 514—256 **23 Claims**

1. A compound of formula I



(I)

wherein

X is oxygen or sulphur; and

R^1 is hydrogen, straight or branched C_{1-5}-alkyl, straight or branched C_{2-5}-alkenyl, straight or branched C_{2-5}-alkenyl or straight or branched C_{4-5}-alkenynyl, each of which is optionally substituted with a halogen; and

R^2 and R^3 are independently hydrogen, halogen, CN, NO_2, CF_3, OCF_3, C_{1-3}-alkyl, C_{1-3}-alkoxy or C_{1-3}-alkylthio, wherein C_{1-3}-alkyl, C_{1-3}-alkoxy and C_{1-3}-alkylthio are optionally substituted with a halogen, cyano, amino or nitro; and

Ar is pyrimidinyl or furyl; and

n is 1 or 2; and

m is 1 or 2; or

a pharmaceutically acceptable salt thereof.

6,015,814
QUINAZOLINE DERIVATIVE

Andrew John Barker, Macclesfield, United Kingdom, assignor to Zeneca Limited, London, United Kingdom

PCT No. PCT/GB96/00959, § 371 Date Sep. 26, 1997, § 102(e) Date Sep. 26, 1997, PCT Pub. No. WO96/33978, PCT Pub. Date Oct. 31, 1996

PCT Filed Apr. 23, 1996, Appl. No. 930,042

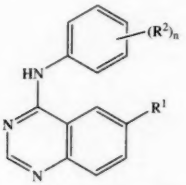
Claims priority, application United Kingdom, Apr. 27, 1995, 9508563

Int. Cl.[7] **A01N** *43/54;* **C07D** *239/72*

U.S. Cl. 514—259 **9 Claims**

1. A quinazole derivative of the formula I

I



wherein n is 1, 2 or 3 and each R^2 is independently halogeno; and R^1 is amino-(2–4C)alkylamino, (1–4C)alkylamino-(2–4C)alkylamino, di-[(1–4C)alkyl]amino-(2–4C)alkylamino, pyrrolidin-1-yl-(2–4C)alkylamino, piperidino-(2–4C)alkylamino, morpholino-(2–4C)alkylamino, piperazin-1-yl-(2–4C)alkylamino or 4-(1–4C)alkylpiperazin-1-yl-(2–4C)alkylamino;
or a pharmaceutically-acceptable salt thereof.

6,015,815
TETRAZOLE-CONTAINING RAPAMYCIN ANALOGS WITH SHORTENED HALF-LIVES

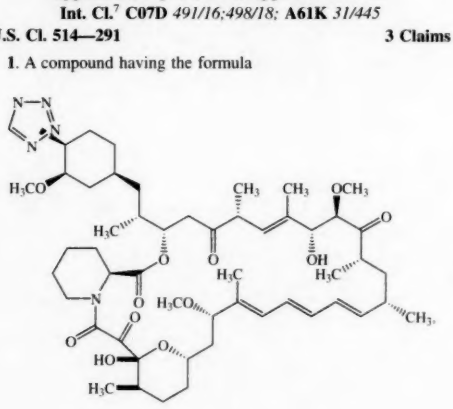
Karl W. Mollison, Arlington Heights, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Provisional application No. 60/060,105, Sep. 26, 1997. This application Sep. 24, 1998, Appl. No. 159,945.

Int. Cl.[7] **C07D** *491/16;498/18;* **A61K** *31/445*

U.S. Cl. 514—291 **3 Claims**

1. A compound having the formula



or a pharmaceutically acceptible salt or prodrug thereof.

6,015,816
ANTIMICROBIAL COMPOSITIONS

Paul J. Kostyniak, Amherst; Rossman F. Giese; Patricia M. Costanzo, both of Elma, and Joseph A. Syracuse, Tonawanda, all of N.Y., assignors to The Research Foundation of State University of New York, Amherst, N.Y.

Provisional application No. 60/012,513, Feb. 29, 1996. This application Feb. 27, 1997, Appl. No. 807,140.

Int. Cl.[7] **A61K** *31/44*

U.S. Cl. 514—299 **68 Claims**

1. A method of controlling microbial growth on a material, said method comprising:

applying to the material an antimicrobial agent comprising:

colloid particles having an ion exchange capacity and having attached a quantity of one or more ligands with antimicrobial properties, wherein the quantity of ligand attached to the colloid particles is in excess of 125% and up to 200% of the ion exchange capacity of the colloid particles.

6,015,817
INHIBITORS OF FARNESYL-PROTEIN TRANSFERASE

Wasyl Halczenko, Lansdale, and Craig A. Stump, Schwenksville, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

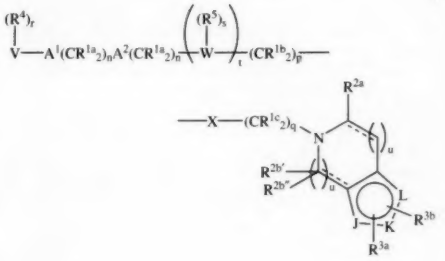
Provisional application No. 60/032,126, Dec. 5, 1996. This application Dec. 4, 1997, Appl. No. 984,732.

Int. Cl.[7] **A61K** *31/435;* **C07D** *495/04*

U.S. Cl. 514—301 **30 Claims**

1. A compound which inhibits farnesyl-protein transferase of the formula I:

I



wherein:

R^{1a}, R^{1b} and R^{1c} are independently selected from:

a) hydrogen,

b) unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, C_3–C_{10} cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, NO_2, $(R^8)_2N$—$C(NR^8)$—, $R^8C(O)$—, $R^8OC(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)NR^8$—,

c) C_1–C_6 alkyl unsubstituted or substituted by unsubstituted or substituted aryl, heterocyclic, C_3–C_{10} cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, $(R^8)_2N$—$C(NR^8)$—, $R^8C(O)$—, $R^8OC(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)$—NR^8—,

provided that R^{1a} is not unsubstituted or substituted imidazolyl;

R^{2a}, R^{2b} and $R^{2b'}$ are independently hydrogen or —$(CR^{11}{}_2)_vA^3(CR^{12}{}_2)_wR^{13}$; or

R^{2b} and $R^{2b'}$ are combined as O;

R^{3a} and R^{3b} are independently selected from:

a) hydrogen,

b) unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, unsubstituted or substituted C_3–C_{10} cycloalkyl, unsubstituted or substituted C_2–C_6 alkenyl, C_2–C_6 alkynyl, halogen, C_1–C_6 perfluoroalkyl, R^9O—,

$R^9S(O)_m$—, $R^8C(O)NR^8$—, $(R^8)_2NC(O)$—, $R^9C(O)O$—, $R^8{}_2N$—$C(NR^8)$—, CN, NO_2, $R^8C(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)NR^8$—,

c) unsubstituted C_1–C_6 alkyl,

d) substituted C_1–C_6 alkyl wherein the substituent on the substituted C_1–C_6 alkyl is selected from unsubstituted or substituted aryl, unsubstituted or substituted heterocyclic, C_3–C_{10} cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, R^9O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, $(R^8)_2NC(O)$—, $R^8{}_2N$—$C(NR^8)$—, CN, $R^8C(O)$—, N_3, —$N(R^8)_2$, and $R^9OC(O)$—NR^8—;

R^4 is independently selected from:

a) hydrogen,

b) unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, C_3–C_{10} cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, perfluoroalkyl, F, Cl, Br, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, NO_2, $R^8{}_2N$—$C(NR^8)$—, $R^8C(O)$—, $R^8OC(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)NR^8$—, and

c) C_1–C_6 alkyl urisubstituted or substituted by aryl, heterocycle, C_3–C_{10} cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, perfluoroalkyl, F, Cl, Br, R^8O—, $R^9S(O)_m$—, $R^8C(O)NH$—, CN, H_2N—$C(NH)$—, $R^8C(O)$—, $R^8OC(O)$—, N_3, —$N(R^8)_2$, or $R^8OC(O)NH$—,

provided that R^4 is not unsubstituted or substituted imidazolyl;

R^5 is independently selected from:

a) hydrogen,

b) C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_3–C_6 cycloalkyl, perfluoroalkyl, F, Cl, Br, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, NO_2, $(R^8)_2N$—C—(NR^8)—, $R^8C(O)$—, $R^8OC(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)NR^8$—, and

c) C_1–C_6 alkyl, unsubstituted or substituted by perfluoroalkyl, F, Cl, Br, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, $(R^8)_2N$—$C(NR^8)$—, $R^8C(O)$—, $R^8OC(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)NR^8$—;

R^8 is independently selected from hydrogen, C_1–C_6 alkyl, benzyl, 2,2,2-trifluoroethyl and aryl;

R^9 is independently selected from C_1–C_6 alkyl and aryl;

R^{10} is selected from: H; $R^8C(O)$—; $R^9S(O)_m$—; unsubstituted or substituted $C_{1\text{-}4}$ alkyl, unsubstituted or substituted $C_{1\text{-}6}$ cycloalkyl, unsubstituted or substituted heterocycle, unsubstituted or substituted aryl, substituted aroyl, unsubstituted or substituted heteroaroyl, substituted arylsulfonyl, unsubstituted or substituted heteroarylsulfonyl, wherein the substituted group is substituted with one or two substituents selected from:

a) $C_{1\text{-}4}$ alkoxy,

b) aryl or heterocycle,

c) halogen,

d) HO,

e) ,

f) ,

g) $—S(O)_mR^9$,

h) $N(R^8)_2$, or

i) $C_{3\text{-}6}$ cycloalkyl;

R^{11} and R^{12} are independently selected from:

a) hydrogen,

b) C_1–C_6 alkyl unsubstituted or substituted by C_2–C_{20} alkenyl, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, N_3, $(R^8)_2N$—$C(NR^8)$—, $R^8C(O)$—, —$N(R^8)_2$, or $R^9OC(O)NR^8$—,

c) unsubstituted or substituted aryl, unsubstituted or substituted heterocycle, C_3–C_{10} cycloalkyl, C_2–C_{20} alkenyl, halogen, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, NO_2, $(R^8)_2N$—$C(NR^8)$—, $R^8C(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)NR^8$—, and

d) C_1–C_6 alkyl substituted with an unsubstituted or substituted group selected from aryl, heterocyclic and C_3–C_{10} cycloalkyl;

R^{13} is selected from:

a) hydrogen,

b) substituted or unsubstituted aryl, substituted or unsubstituted heterocycle, C_3–C_{10} cycloalkyl, C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, C_1–C_{20} perfluoroalkyl, allyloxy, F, Cl, Br, R^8O—, $R^9S(O)_m$—, $R^8C(O)NR^8$—, CN, NO_2, $R^8{}_2N$—$C(NR^8)$—, $R^8C(O)$—, N_3, —$N(R^8)_2$, $(R^9)_2NC(O)$— or $R^9OC(O)NR^8$—, and

c) C_1–C_6 alkyl urisubstituted or substituted by substituted or unsubstituted aryl, substituted or tnsubstituted heterocycle, C_3–C_{10} cycloalkyl, C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, C_2–C_{20} perfluoroalkyl, F, Cl, Br, R^8O—, $R^9S(O)_m$—, $R^8C(O)NH$—, CN, H_2N—$C(NH)$—, $R^8C(O)$—, N_3, —$N(R^8)_2$, or $R^9OC(O)NH$—;

A^1 and A^2 are independently selected from: a bond, —CH=CH—, —C≡C—, —C(O)—, —C(O)NR^8—, —$NR^8C(O)$—, O, —$N(R^8)$—, —$S(O)_2N(R^8)$—, —$N(R^8)S(O)_2$—, or —$S(O)_m$;

A^3 are independently selected from: a bond, —CH=CH—, —C≡C—, —C(O)—, —C(O)NR^{10}—, —$NR^{10}C(O)$—, O, —$N(R^{10})$—, —$S(O)_2N(R^{10})$—, —$N(R^{10})S(O)_2$—, or —$S(O)_m$;

J-K-L represents CH=CH—S;

V is selected from:

a) hydrogen,

b) heterocycle,

c) aryl,

d) C_1–C_{20} alkyl wherein from 0 to 4 carbon atoms are replaced with a heteroatom selected from O, S, and N, and

e) C_2–C_{20} alkenyl,

provided that V is not hydrogen if A^1 is —$S(O)_m$ and V is not hydrogen if A^1 is a bond, n is 0 and A^2 is —$S(O)_m$;

and provided that V is not imidazolyl;

W is imidazolyl;

X is a bond, —$S(O)_m$—, O or —C(=O)—;

m is 0, 1 or 2;

n is 0, 1, 2, 3 or 4;

p is 0, 1, 2, 3 or 4;

q is 0, 1, 2, 3 or 4, provided that q is not 0 or 1 if X is O;

r is 0 to 5, provided that r is 0 when V is hydrogen;

s is 1 or 2;

t is 1;

u is independently 0,1 or 2; provided that the sum of the u variables is equal to 2;

v is 0, 1, 2, 3 or 4, provided that v is not 0 when A^3 is —$NR^{10}C(O)$—, O, —$N(R^{10})$—, —$S(O)_2N(R^{10})$—, —$N(R^{10})S(O)_2$—, or $S(O)_m$;

w is 0, 1, 2, 3 or 4; and

the dashed lines represent optional double bonds;

or an optical isomer or a pharmiaceutically acceptable salt thereof.

6,015,818

QUINOLINE DERIVATIVES AS BRADYKININ AGONISTS

Teruo Oku; Hiroshi Kayakiri, both of Tsukuba; Yoshito Abe, Inashiki-gun; Yuki Sawada, and Tsuyoshi Mizutani, both of Tsukuba, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP97/00233, § 371 Date Aug. 3, 1998, § 102(e) Date Aug. 3, 1998, PCT Pub. No. WO97/28153, PCT Pub. Date Aug. 7, 1997

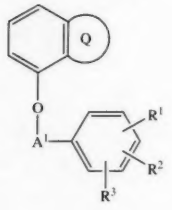
PCT Filed Jan. 31, 1997, Appl. No. 117,453

Claims priority, application United Kingdom, Feb. 1, 1996, 96-02029

Int. Cl.[7] C07D *401/12;401/14;* A61K *31/395*

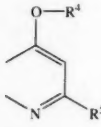
U.S. Cl. 514—312 9 Claims

1. A compound of the formula:



or its pharmaceutical acceptable salt, wherein

is a group of the formula:



in which

R^4 is heterocyclic(lower)alkyl, and

R^5 is lower alkyl,

R^1 is hydrogen, lower alkyl or halogen,

R^2 is lower alkyl or halogen,

R^3 is amino mono- or di-substituted with substituent(s) selected from the group consisting of lower alkyl and acyl, or a group of the formula:

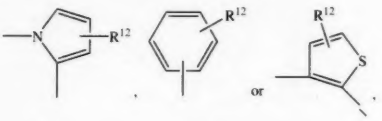
$$-Z-A^2-R^{11},$$

in which

R^{11} is amino or acylamino,

A^2 is lower alkylene or a single bond, and

Z is lower alkenylene or a group of the formula:



in which

R^{12} is hydrogen or halogen,

and

A^1 is lower alkylene.

6,015,819

USE OF ALPHA-1C SPECIFIC COMPOUNDS TO TREAT BENIGN PROSTATIC HYPERPLASIA

Charles Gluchowski, Danville, Calif.; Carlos C. Forray, Paramus, N.J.; George Chiu, Bridgewater, N.J.; Theresa A. Branchek, Teaneck, N.J.; John M. Wetzel, Elmwood Park, N.J., and Paul R. Hartig, Pennington, N.J., assignors to Synaptic Pharmaceutical Corporation, Paramus, N.J.

PCT No. PCT/US93/10950, § 371 Date Apr. 1, 1997, § 102(e) Date Apr. 1, 1997, PCT Pub. No. WO94/10989, PCT Pub. Date May 26, 1994

Continuation-in-part of application No. 07/975,867, Nov. 13, 1992, Pat. No. 5,403,847. This PCT application Nov. 12, 1993, Appl. No. 244,354.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *31/445;31/135*

U.S. Cl. 514—318 58 Claims

1. A method of treating benign prostatic hyperplasia in a subject which comprises administering to the subject a therapeutically effective amount of an antagonist which binds to a human α_{1C} adrenergic receptor with a binding affinity at least 48-fold higher than the binding affinity with which the antagonist binds to a human α_{1B} adrenergic receptor, and wherein administration of the antagonist does not cause an orthostatic fall in blood pressure.

6,015,820

4-ARYL-THIO-PYRIDIN-2(1H)-ONES, MEDICINES CONTAINING THEM AND THEIR USES IN THE TREATMENT OF ILLNESSES LINKED TO HIV

Emile Bisagni; Valérie Dolle, both of Orsay; Chi Hung Nguyen, Massy; Michel Legraverend, Antony; Anne-Marie Aubertin; André Kirn, both of Strasbourg; Marie-Line Andreola, La Brede; Laura Tarrago-Litvak, Pessac, and Michel Ventura, Villenave D'Ornon, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris Cedex, France

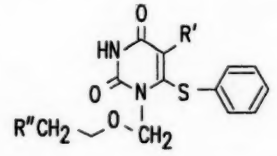
PCT No. PCT/FR96/01204, § 371 Date Apr. 15, 1998, § 102(e) Date Apr. 15, 1998, PCT Pub. No. WO97/05113, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 30, 1996, Appl. No. 142

Claims priority, application France, Jul. 31, 1995, 95/09323

Int. Cl.[7] A61K *31/44;* C07D *213/70;213/73;213/75;215/38*

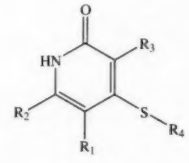
U.S. Cl. 514—348 16 Claims



(1a)(HEPT) : R′ = CH_3 AND R″ = OH

(1b)(E-EPU) : R′ = CH_2CH_3 AND R″ = H

1. A compound of formula (3):



in which:

R_1 and R_2 independently represent an atom of hydrogen, an aliphatic group or an alkyloxyalkyl group in which the alkyl chains are from C_1 to C_4 or together form an aromatic ring;

R_3 represents:

an atom of hydrogen, or

an NHR_5 group in which R_5 represents an atom of hydrogen or a COR_6 group in which R_6 is an aliphatic or aromatic group, or

an NO_2 group or

a $COOR_7$ group in which R_7 is an aliphatic group,

R_4 represents a phenyl group.

6,015,821

NICOTINIC ACID ESTERS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

David Frederick Horrobin, Scotia Pharmaceuticals Ltd., Efamol House, Woodbridge Meadows, Guildford, Surrey, GU1 1BA; Mehar Manku, Scotia Pharmaceuticals Ltd., Research and Development Centre, Kingstown Broadway, Kingstown Industrial Estate, Carlisle, CA3 0HA; Austin McMordie, Scotia Pharmaceuticals Ltd., Research & Development Centre, Kingstown Broadway, Kingstown Industrial Estate, Carlisle, CA3 0HA; Philip Knowles, Scotia Pharmaceuticals Ltd., Research & Development Centre, Kingstown Broadway, Kingstown Industrial Estate, Carlisle, CA3 0HA, all of United Kingdom; Peter Redden, Efamol Research Inc., Unit 2, Chapman Drive, Annapolis Industrial Estate, P.O. Box 818 Kentville, Nova Scotia, Canada, B4N 4H8, and Andrea Pitt, Scotia Pharmaceuticals Ltd. Research & Devlopment Centre, Kingstown Broadway, Kingstown Industrial Estate, Carlisle, CA3 0HA, United Kingdom

PCT No. PCT/GB96/01054, § 371 Date Mar. 3, 1998, § 102(e) Date Mar. 3, 1998, PCT Pub. No. WO96/34858, PCT Pub. Date Nov. 7, 1996

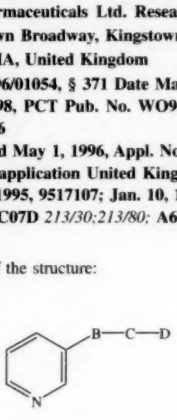
PCT Filed May 1, 1996, Appl. No. 952,305

Claims priority, application United Kingdom, May 1, 1995, 9508823; Aug. 21, 1995, 9517107; Jan. 10, 1996, 9600431

Int. Cl.[7] **C07D** *213/30;213/80;* **A61K** *31/44*

U.S. Cl. 514—355 **8 Claims**

1. A compound of the structure:



wherein B is selected from the group consisting of —C(=O)— and —CH_2—O—, C is selected from the group consisting of a diol residue a hydroxy-substituted carboxylic acid residue and a dicarboxylic acid residue, with the proviso that when B is —CH_2—O—, C is not a diol residue, D is selected from the group consisting of a fatty acid residue and a fatty alcohol residue, wherein the acid residues or alcohol residues form ester linkages with the corresponding alcohols or acids.

6,015,822

SULFONAMIDE-SUBSTITUTED FUSED 5-MEMBERED RING COMPOUNDS, THEIR USE AS A MEDICAMENT, AND PHARMACEUTICAL PREPARATIONS COMPRISING THEM

Joachim Brendel, Bad Vilbel; Uwe Gerlach, Hattersheim; Hans Jochen Lang, Hofheim, and Klaus Weidmann, Kronberg, all of Germany, assignors to Hoechst Marion Roussel Deutschland GmbH, Frankfurt am Main, Germany

Filed Nov. 9, 1998, Appl. No. 188,181

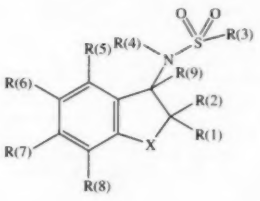
Claims priority, application Germany, Nov. 10, 1997, 197 49 453

Int. Cl.[7] **A61K** *31/44;* **C07D** *213/42*

U.S. Cl. 514—357 **23 Claims**

1. A compound of the formula I

I



in which:

R(1) and R(2) independently of one another are hydrogen, CF_3, alkyl having 1, 2, 3, 4, 5 or 6 carbon atoms; or

R(2) and R(9) together are a bond;

or R(2) is —OR(10a), if X is —CR(22)R(23)—;

R(10a) is hydrogen, acetyl or alkyl having 1, 2 or 3 carbon atoms;

R(3) is R(10b)—C_nH_{2n}—NR(11)— or R(10b)—C_nH_{2n}—, where a CH_2 group in the C_nH_{2n} group is unchanged or is replaced by —O—, —CO—, —S—, —SO—, —SO_2— or —NR(12a)—;

R(12a) is hydrogen, methyl or ethyl;

R(10b) is methyl, cycloalkyl having 3, 4, 5, 6, 7 or 8 carbon atoms, CF_3, C_2F_5 or C_3F_7;

n is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10;

R(11) is hydrogen or alkyl having 1, 2, 3, 4, 5 or 6 carbon atoms; or

R(10b) and R(11) together are a bond if n is greater than 2;

or

R(3) together with R(4) is an alkylene chain having 3, 4, 5, 6, 7 or 8 carbon atoms, where a CH_2 group of the alkylene chain is unchanged or is replaced by —O—, —CO—, —S—, —SO—, —SO_2— or —NR(12a)—;

R(12a) is hydrogen, methyl or ethyl;

R(4) is R(13)—C_yH_{2y}, where a CH_2 group of the C_yH_{2y} group is unchanged or is replaced by —O—, —CH=CH—, —C≡C—, —CO—, —CO—O—, —O—CO—, —S—, —SO—, —SO_2—, —NR(14)— or —CONR(14)—;

R(14) is hydrogen, alkyl having 1, 2 or 3 carbon atoms, —C_yH_{2y}—OR(12b), —C_yH_{2y}—NR(12b)$_2$;

R(12b) is hydrogen, methyl or ethyl;

y is 2 or 3;

R(13) is CH_3, CF_3, C_2F_5, C_3F_7, cycloalkyl having 3, 4, 5, 6, 7 or 8 carbon atoms, —NR(15)R(16), —CONR(15)R(16), —OR(17), —COOR(17), phenyl or a nitrogen-containing heterocycle having 1, 2, 3, 4, 5, 6, 7, 8 or 9 carbon atoms, where phenyl and the nitrogen-containing heterocycle are unsubstituted or substituted by 1 or 2 substituents, selected from the group consisting of F, Cl, Br, I, CF_3, NO_2, CN, NH_2, OH, methyl, ethyl, methoxy, dimethylamino, sulfamoyl, methylsulfonyl and methylsulfonylamino;

R(15) and R(16) independently of one another are hydrogen or alkyl having 1, 2, 3 or 4 carbon atoms; or

R(15) and R(16) together are a chain of 4 or 5 methylene groups of which a CH_2 group is unchanged or is replaced by —O—, —S—, —NH—, —N(CH_3)— or —N(benzyl)-;

R(17) is hydrogen, alkyl having 1, 2 or 3 carbon atoms, $—C_zH_{2z}OR(12c)$;

R(12c) is hydrogen, methyl or ethyl;

z is 2 or 3;

r is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20;

R(5), R(6), R(7) and R(8) independently of one another are hydrogen, F, Cl, Br, I, alkyl having 1, 2, 3, 4 or 5 carbon atoms, cycloalkyl having 3, 4, 5, 6, 7 or 8 carbon atoms, —CN, $—CF_3$, $—C_2F_5$, $—C_3F_7$, $—N_3$, $—NO_2$, $—Y—C_sH_{2s}—R(18)$, phenyl, thienyl, furyl or a nitrogen-containing heterocycle having 1, 2, 3, 4, 5, 6, 7, 8 or 9 carbon atoms, where phenyl, thienyl, furyl and the nitrogen-containing heterocycle are unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of F, Cl, Br, I, CF_3, NO_2, CN, NH_2, OH, methyl, ethyl, methoxy, dimethylamino, sulfamoyl, methylsulfonyl and methylsulfonylamino;

Y is —O—, —CO—, —CO—O—, —O—CO—, —S—, —SO—, $—SO_2—$, —O—SO_2—, $—SO_2NR(10c)—$ or —CONR(10c)—, where the link to the phenyl group is in each case effected through the atom on the left;

R(10c) is hydrogen or alkyl having 1, 2 or 3 carbon atoms;

s is zero, 1, 2, 3, 4, 5 or 6;

R(18) is hydrogen, methyl, CF_3, C_2F_5, C_3F_7, cycloalkyl having 3, 4, 5, 6, 7 or 8 carbon atoms, —OR(21), —COOR(21), —NR(15a)R(16a), —CONR(15a)R(16a), phenyl or a nitrogen-containing heterocycle having 1, 2, 3, 4, 5, 6, 7, 8 or 9 carbon atoms, where phenyl and the nitrogen-containing heterocycle are unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of F, Cl, Br, I, CF_3, NO_2, CN, NH_2, OH, methyl, ethyl, methoxy, dimethylamino, sulfamoyl, methylsulfonyl and methylsulfonylamino;

R(15a) and R(16a) independently of one another are hydrogen or alkyl having 1, 2, 3 or 4 carbon atoms; or

R(15a) and R(16a) together are a chain of 4 or 5 methylene groups of which a CH_2 group is unchanged or is replaced by —O—, —S—, —NH—, $—N(CH_3)—$ or —N(benzyl)-;

R(21) is hydrogen or alkyl having 1, 2 or 3 carbon atoms;

R(9) is hydrogen or together with R(2) is a bond;

X is —CR(22)R(23)—;

R(22) and R(23) independently of one another are hydrogen, CF_3, alkyl having 1, 2, 3, 4, 5 or 6 carbon atoms;

or a physiologically tolerable salt thereof.

6,015,823

4-CYCLOHEXYLPHENYL-OXAZOLINES AND THEIR USE FOR CONTROLLING ANIMAL PESTS

Wolfgang Krämer, Burscheid; Christoph Erdelen, Leichlingen; Ulrike Wachendorff-Neumann, Neuwied; Andreas Turberg, Haan, and Norbert Mencke, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP97/06392, § 371 Date May 19, 1999, § 102(e) Date May 19, 1999, PCT Pub. No. WO98/23600, PCT Pub. Date Jun. 4, 1998

PCT Filed Nov. 17, 1997, Appl. No. 308,621

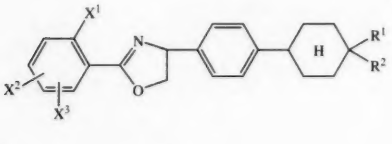
Claims priority, application Germany, Nov. 28, 1996, 196 49 307

Int. Cl.[7] **A01N** *43/76;* **C07D** *263/10;263/14;263/52;413/10*

U.S. Cl. 514—374 **25 Claims**

1. A compound of the formula (I)

(I)



wherein

X^1 represents halogen, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, amino, alkylamino or dialkylamino,

X^2 and X^3 are identical or different and each represents hydrogen halogen, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, amino, alkylamino or dialkylamino,

R^1 represents hydrogen, $—OR^3$ or $—SR^5$ and

R^2 represents $—OR^4$,

wherein

R^3 and R^4 are identical or different and each represents hydrogen, alkyl, alkenyl or unsubstituted or substituted benzyl, or R^3 and R^4 join with the hetero atoms to which they are attached and the carbon atom linking these to form an unsubstituted or substituted 5- or 6-membered ring,

or

R^1 and R^2 together represent oxygen or represent $=N—OR^5$ or $=N—NR^6R^7$,

wherein

R^5 represents hydrogen, alkyl, alkenyl, alkynyl, halogenoalkyl or unsubstituted or substituted benzyl,

R^6 represents hydrogen, alkyl, alkenyl, alkynyl, halogenoalkyl or unsubstituted or substituted benzyl, and

R^7 represents alkyl, alkylcarbonyl, alkoxycarbonyl, unsubstituted or substituted phenyl, phenylcarbonyl or benzyl, or represents $—CONR^5R^6$ or $—SO_2NR^8R^9$

wherein

R^8 represents hydrogen, alkyl, alkenyl, alkynyl, halogenoalkyl or unsubstituted or substituted benzyl, and

R^9 represents alkyl, alkylcarbonyl, alkoxycarbonyl or unsubstituted or substituted phenyl, phenylcarbonyl or benzyl.

6,015,824

PYRROLIDINE AND PIPERIDINE DERIVATIVES AND TREATMENT OF NEURODEGENERATIVE DISORDERS

Alexander Alanine, Riedisheim, France; Bernd Büttelmann, Schopfheim, Germany; Marie-Paule Heitz Neidhart, Hagenthal le Bas; Emmanuel Pinard, Linsdorf, both of France, and René Wyler, Zürich, Switzerland, assignors to Hoffmann-La Roche AG, Nutley, N.J.

Filed Jan. 20, 1999, Appl. No. 234,266

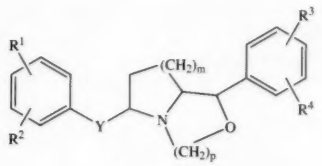
Claims priority, application European Pat. Off., Feb. 10, 1998, 98102246

Int. Cl.[7] **A61K** *31/42;31/445;31/535;* **C07D** *263/52;471/04*

U.S. Cl. 514—375 **5 Claims**

1. A method of treating a disease in a mammal caused by over activation of NMDA receptor subtypes comprising administering to said mammal in need thereof a compound of formula II

II



wherein

R^1 and R^2 are, independently from each other, hydrogen, lower alkoxy, hydroxy, halogen, $—CONH_2$ or —C(O)O-lower alkyl; or taken together are $—O—CH_2O$;

R^3 and R^4 are, independently from each other, hydrogen, lower alkoxy, benzyloxy, halogen, hydroxy, $—CONH_2$ or $—SCH_3$; or taken together are $—O—CH_2—O—$;

Y is —CH(OH)—, $—(CH_2)_n—$, —C(O)— or —CH(lower alkoxy)—; and

m, n and p are 1 or 2;

or a pharmaceutically acceptable salt thereof and a therapeutically acceptable carrier in an amount which is effective in treating disease caused by over activation of NMDA receptor subtypes.

6,015,825

TRIAZOLE ANTIFUNGAL AGENTS

Andrew Simon Bell; Michael Jonathan Fray; Alan Patrick Marchington; Kenneth Richardson; Peter Thomas Stephenson, and Peter John Whittle, all of Sandwich, United Kingdom, assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP96/02470, § 371 Date Dec. 19, 1997, § 102(e) Date Dec. 19, 1997, PCT Pub. No. WO97/01552, PCT Pub. Date Jan. 16, 1997

PCT Filed Jun. 5, 1996, Appl. No. 983,006

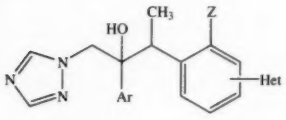
Claims priority, application United Kingdom, Jun. 25, 1995, 9512961

Int. Cl.[7] **A61K** *31/41;* **C07D** *403/10*

U.S. Cl. 514—383 **8 Claims**

1. A compound of formula (I)

(I)



or a pharmaceutically acceptable salt thereof, wherein:

Ar is phenyl substituted by 1 to 3 substituents each independently selected from halo and CF_3;

Z is H or F; and,

Het is pyrazolyl optionally substituted by 1 to 3 substituents each independently selected from halo, C_1–C_4 alkyl, (C_1–C_4 alkoxy)methyl, 2-(C_1–C_4 alkoxy)ethoxymethyl, 2-hydroxyethoxymethyl, cyanomethyl, phenylthio, phenyl-substituted C_1–C_2 alkyl, —NHC(O)(C_1–C_4 alkyl), —NHSO$_2$(C_1–C_4 alkyl), —S(O)$_n$(C_1–C_4 alkyl) where n is an integer from 0 to 2, —NHC(O)NR^{1}R^2, —NR^{1}R^2 and —CH$_2$C(O)NR^{1}R^2 where R^1 and R^2 are each independently H or C_1–C_4 alkyl, and the phenyl groups of the foregoing Het groups are optionally substituted by halo, trifluoromethyl, or C_1–C_4 alkyl.

6,015,826

3-(SUBSTITUTED PHENYL)-5-(THIENYL OR FURYL)-1, 2, 4-TRIAZOLE COMPOUNDS

James T. Pechacek, 1230 Munsee Ct., Indianapolis, Ind. 46260; Donald H. DeVries, 9878 Woodlands Dr., Fishers, Ind. 46038; Francis E. Tisdell, 68 Parkview Rd., Carmel, Ind. 46032; Robert G. Suhr, 1522 Bruner Dr., Greenfield, Ind. 46140; Peter L. Johnson, 8016 N. Dartmouth Rd., Indianapolis, Ind. 46260; Christopher J. Hatton, 2525 State Rd. 38 East, Westfield, Ind. 46074; Maurice Chee Hoong Yap, 22 Chestnut Ct., Zionsville, Ind. 46077; Gary D. Stockdale, 8722 Knickerbocker Way Apt. 4D, Indianapolis, Ind. 46240; Christopher T. Hamilton, 8918 Dandy Creek Dr., Indianapolis, Ind. 46234, and George W. Johnson, 6715 Knollcreek Dr., Indianapolis, Ind. 46256

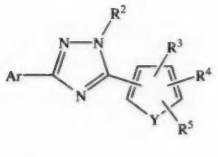
Provisional application No. 60/044,697, Apr. 24, 1997, Provisional application No. 60/066,135, Nov. 19, 1997. This application Mar. 26, 1998, Appl. No. 48,601.

Int. Cl.[7] **A01N** *43/653;* **C07D** *409/04;405/04*

U.S. Cl. 514—383 **18 Claims**

1. A compound of the formula (I)

(I)



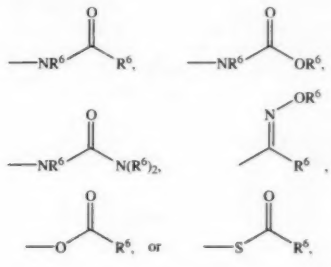
wherein

Ar is substituted phenyl;

Y is O or S;

R^2 is lower alkyl, haloalkyl, lower alkenyl, lower alkynyl, or alkoxyalkyl;

R^3 is selected from H, halo, lower alkyl, (C_7–C_{21}) straight or branched chain alkyl, hydroxy, lower alkoxy, haloalkyl, haloalkoxy, alkoxyalkyl, alkoxyalkoxy, lower alkenyl, lower alkynyl, haloalkenyl, CN, NO_2, COR^6, CO_2R^6, CON(R^6)$_2$, (C_3–C_8) cycloalkyl, S(O)$_m$ R^6, —OSO$_2$R^6, SCN, —(CH$_2$)$_q$R^6, —CH=CHR^6, —C≡CR^6, —(CH$_2$)$_q$OR^6, —(CH$_2$)$_q$SR^6, —(CH$_2$)$_q$NR^{6}R^6, —O(CH$_2$)$_q$R^6, —S(CH$_2$)$_q$R^6, —NR^6(CH$_2$)$_q$R^6,



—Si(R^7)$_3$ naphthyl, substituted naphthyl, phenyl, substituted phenyl;

R^4 and R^5 are independently H, halo, lower alkyl, lower alkoxy, haloalkyl, haloalkoxy, CN, CO_2R^6, CON(R^6)$_2$, or S(O)$_m$ alkyl, or

if R^4 and R^5 are attached to adjacent carbon atoms, they may join to form a 5 or 6 member saturated or unsaturated carbocyclic ring which may be substituted by 1 or 2 halo, lower alkyl, lower alkoxy or haloalkyl groups;

R^6 is H, lower alkyl, haloalkyl, lower alkenyl, lower alkynyl, phenyl, or substituted phenyl;

R^7 is lower alkyl;

m is 0, 1, or 2;

n is 1 or 2;

p is an integer from 2 to 6; and

q is 0 or 1;

or a phytologically acceptable acid addition salt thereof, where, in the foregoing definitions of R^1 through R^7,

the term "lower alkyl" refers to (C_1–C_6) straight hydrocarbon chains and (C_3–C_6) branched and cyclic hydrocarbon groups;

the terms "lower alkenyl" and "lower alkynyl" refer to (C_2–C_6) straight hydrocarbon chains and (C_3–C_6) branched hydrocarbon groups containing at least one double or triple bond, respectively;

the term "lower alkoxy" refers to —O—lower alkyl;

the terms "halomethyl" and "haloalkyl" refer to methoxy and lower alkyl groups substituted with one or more halo atoms;

the terms "halomethoxy" and "haloalkoxy" refer to methyl and lower alkoxy groups substituted with one or more halo atoms;

the term "alkoxyalkyl" refers to a lower alkyl group substituted with a lower alkoxy group;

the term "alkoxyalkoxy" refers to a lower alkoxy group substituted with a lower alkoxy group;

the term "substituted naphthyl" refers to naphthyl substituted with one or more groups independently selected from halo, halo (C_1–C_4) alkyl, CN, NO_2, (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, (C_1–C_4) alkoxy, or halo (C_1–C_4) alkoxy;

the term "substituted phenyl" refers to a phenyl group substituted with one or more groups independently selected from halo, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_7) alkyl, hydroxy (C_1–C_7) alkyl, (C_1–C_7) alkoxy, halo (C_1–C_7) alkoxy, phenoxy, phenyl, NO_2, OH, CN, (C_1–C_4) alkanoyl, benzoyl, (C_1–C_4) alkanoyloxy, (C_1–C_4) alkoxycarbonyl, phenoxycarbonyl, or benzoyloxy; and

the term "substituted benzenesulfonyl" refers to p-chlorobenzenesulfonyl and p-toluenesulfonyl.

6,015,827

BENZOXAZOLE-4-CARBOXAMIDES AND THEIR USE IN INHIBITING POLY (ADP-RIBOSE) POLYMERASE ACTIVITY AND IMPROVING CYTOTOXIC EFFECTIVENESS OF CYTOTOXIC DRUGS OR RADIOTHERAPY

Roger John Griffin, Northumberland; Alan Hilary Calvert; Nicola Jane Curtin, both of Tyne & Wear; David Richard Newell, Northumberland, and Bernard Thomas Golding, Newcastle Upon Tyne, all of United Kingdom, assignors to Newcastle University Ventures Limited

Division of application No. 08/706,326, Aug. 30, 1996, Pat. No. 5,756,510, which is a continuation of application No. PCT/GB95/00513, Mar. 9, 1995. This application Apr. 8, 1998, Appl. No. 56,928.

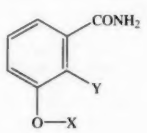
Claims priority, application United Kingdom, Mar. 9, 1994, 9404485

Int. Cl.[7] **C07D** *413/02;263/57;* **A61K** *31/42*

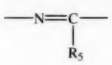
U.S. Cl. 514—394 **9 Claims**

1. A compound of formula I

I



or a pharmaceutically acceptable salt thereof, wherein Y and X together form a bridge —Y—X— which represents the grouping



where R_5 is H, alkyl, optionally substituted aryl or optionally substituted aralkyl.

6,015,828

CHEMICAL MODIFICATION OF CHLORIDE CHANNELS AS A TREATMENT FOR CYSTIC FIBROSIS AND OTHER DISEASES

John Cuppoletti, University of Cincinnati, Intellectual Property Office, 3233 Eden Ave., G-13 Wherry Hall-M.L. 0829, Cincinnati, Ohio 45267-0829

Provisional application No. 60/018,725, May 31, 1996. This application May 23, 1997, Appl. No. 863,102.

Int. Cl.[7] **A01N** *43/50;33/02;* **A61K** *31/415;31/13*

U.S. Cl. 514—397 **17 Claims**

1. A method of treating a pathology having symptoms caused by inadequate chloride transport by defective ClC-2G chloride channels, comprising administering to an individual in need of such treatment 1) a condensation agent and 2) an amine in amounts effective to activate chloride transport by inactivating charged groups on amino acid residues of said channels, thereby counteracting said symptoms.

6,015,829

1-PHENYLPYRAZOLE COMPOUNDS AND MEDICINAL APPLICATION THEREOF

Seigo Ishibuchi; Hiroshi Morimoto; Atsushi Fukunari; Hiroyoshi Inoue, and Yoichi Naka, all of Fukuoka, Japan, assignors to Yoshitomi Pharmaceutical Industries, ltd., Japan

PCT No. PCT/JP97/03840, § 371 Date Sep. 22, 1998, § 102(e) Date Sep. 22, 1998, PCT Pub. No. WO98/18765, PCT Pub. Date May 7, 1998

PCT Filed Oct. 22, 1997, Appl. No. 155,155

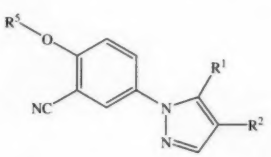
Claims priority, application Japan, Oct. 25, 1996, 8-284479; Mar. 11, 1997, 9-055786; Sep. 26, 1997, 9-261305

Int. Cl.[7] **A61K** *31/415;* **C07D** *231/14;231/38*

U.S. Cl. 514—404 **5 Claims**

1. A 1-phenylpyrazole compound of the formula (1)

(1)



wherein

R^1 is a hydrogen, a halogen or an amino;

R^2 is a carboxy or a C_1–C_4 alkoxycarbonyl; and

R^5 is a C_4–C_6 alkyl, a C_3–C_6 cycloalkyl or a C_3–C_6 cycloalkyl-C_1–C_4 alkyl optionally substituted by 1 or 2 substituents selected from the group consisting of halogen, hydroxy, C_1–C_4 alkoxy, carboxy, C_1–C_4 alkoxycarbonyl and acyloxy,

an optical isomer thereof or a pharmaceutically acceptable salt thereof.

6,015,830

ANTIBACTERIAL COMPOUNDS FOR *RALSTONIA SOLANACEARUM*

Kazuhiko Matsuda, Nara; Hideyoshi Toyoda, Kyoto, and Satoshi Harada, Tochigi, all of Japan, assignors to Kagome Kabushiki Kaisha, Aichi, Japan

Filed Jan. 13, 1999, Appl. No. 229,207

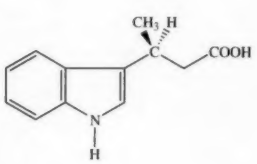
Claims priority, application Japan, Feb. 5, 1998, 10-041317

Int. Cl.[7] **A01N** *43/38;* **C07D** *209/04;209/12;209/18*

U.S. Cl. 514—419 **2 Claims**

1. An antibacterial composition for *Ralstonia solanacearum* comprising as an active component of said composition (S)-3-(3-indolyl) butanoic acid shown by Formula 1 given below or a salt thereof:

Formula 1



and an antibacterially acceptable carrier or dilvent.

6,015,831

THIOPHENE NITRONE COMPOUNDS

Judith A. Kelleher, Fremont; Kirk R. Maples, San Jose, and Yong-Kang Zhang, Santa Clara, all of Calif., assignors to Centaur Pharmaceuticals, Inc., Sunnyvale, Calif.

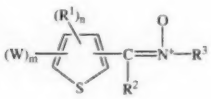
Provisional application No. 60/072,790, Jan. 16, 1998. This application Jan. 14, 1999, Appl. No. 245,126.

Int. Cl.[7] A61K *31/35*; C07D *333/32*

U.S. Cl. 514—445 39 Claims

1. A compound of formula I:

I



wherein

each R^1 is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, aralkyl, aryl, alkoxy, substituted alkoxy, cycloalkyl and halo;

R^2 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, aralkyl, aryl, cycloalkyl and cycloalkylalkyl;

R^3 is selected from the group consisting of alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, aralkyl, aryl, cycloalkyl, cycloalkylalkyl and cycloalkenyl;

each W is independently selected from the group consisting of $—SR^4$, $—S(O)R^5$, $—SO_2R^6$, $—SO_3Y$, and $—SO_2NR^7R^8$;

wherein Y is hydrogen or a pharmaceutically acceptable cation;

R^4 is selected from the group consisting of alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, aralkyl, aryl, cycloalkyl, cycloalkylalkyl and cycloalkenyl;

R^5 is selected from the group consisting of alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, aralkyl, aryl, cycloalkyl, cycloalkylalkyl and cycloalkenyl;

R^6 is selected from the group consisting of alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, aralkyl, aryl, cycloalkyl, cycloalkylalkyl and cycloalkenyl;

R^7 and R^8 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, aralkyl, aryl, cycloalkyl, cycloalkylalkyl and cycloalkenyl; or R^7 and R^8 together with the nitrogen atom to which they are attached can form a heterocyclic ring containing from 2 to 8 carbon atoms and optionally from 1 to 3 additional heteroatoms selected from the group consisting of oxygen, nitrogen and sulfur;

m is an integer from 1 to 3; and n is an integer from 0 to 2, provided that m+ n=3; and optical isomers and racemates thereof, and pharmaceutically acceptable salts thereof.

6,015,832

METHODS OF INACTIVATING BACTERIA INCLUDING BACTERIAL SPORES

James R. Baker, Jr., Ann Arbor, Mich.; D. Craig Wright, Gaithersburg, Md.; Michael M. Hayes; Tarek Hamouda, both of Ypsilanti, Mich., and Joan Brisker, Silver Spring, Md., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Dec. 31, 1997, Appl. No. 2,228

Int. Cl.[7] A61K *31/22*;*31/225*

U.S. Cl. 514—546 48 Claims

1. A method of inactivating a Gram positive bacteria comprising contacting said Gram positive bacteria with a bacteria-inactivating emulsion, such that said Gram positive bacteria is inactivated, wherein said bacteria-inactivating emulsion comprises an oil-in-water emulsion in the form of a discontinuous oil phase distributed in an aqueous phase with a surfactant stabilizer, said oil phase comprising an organic phosphate-based solvent and a carrier oil.

6,015,833

CONJUGATED LINOLEIC ACID COMPOSITIONS

Asgeir Sæbø, Oersta, Norway, and Carl Skarie, Detroit Lakes, Mich., assignors to ConLinCo., Inc., Minn.

Filed Mar. 17, 1998, Appl. No. 42,767

Int. Cl.[7] A61K *31/20*

U.S. Cl. 514—558 16 Claims

1. An isomerized linoleic acid composition containing at least 50 percent conjugated linoleic acid

said isomerized linoleic acid composition being characterized in having less than 1 percent of a class of octadecadienoic acid isomers selected from 11,13-octadecadienoic acid isomers, 8,10-octadecadienoic acid isomers and trans-trans octadecadienoic acid isomers.

6,015,834

IN VIVO TREATMENT OF MAMMALIAN CELLS WITH A CELL MEMBRANE PERMEANT CALCIUM BUFFER

Milton P. Charlton, Toronto, and Michael Tymianski, Willowdale, both of Canada, assignors to Toronto Neuroprotection Group, Toronto, Canada

Filed Oct. 20, 1992, Appl. No. 963,676

Int. Cl.[7] A61K *31/195*

U.S. Cl. 514—561 16 Claims

1. A method of reducing the damaging effect of an excitotoxic, ischemic or traumatic injury to cells in mammalian tissue of a host in vivo and treatment of epilepsy, said method comprising treating a host in need of such treatment with a non-toxic, damage-reducing effective amount of a cell membrane permeant calcium buffer which is a calcium ion chelating agent having a K_D selected from the range 1×10^{-4} to 1×10^{-8} Molar.

6,015,835

METHODS OF INDUCING ANALGESIA OR ANESTHESIA AND TREATING OR PREVENTING ISCHEMIC INJURY OF TISSUES IN GENERAL

Tadaomi Miyamoto, Kitakyushu, and Koho Miyamoto, Okinawa-ken, both of Japan, assignors to Meddiss, Incorporated, Fukuoka, Japan

Continuation-in-part of application No. 08/622,606, Mar. 26, 1996, abandoned. This application Feb. 24, 1998, Appl. No. 28,482.

Int. Cl.[7] A01N *37/12*

U.S. Cl. 514—562 12 Claims

1. A method of treating or preventing ischemic injury of mammalian tissues, consisting essentially of intravenously administering to a mammal in need thereof a therapeutically effective amount of a hypertonic solution containing at least one compound selected from the group consisting of taurine, homotaurine, and 1-methionine.

6,015,836

CHEMICAL DISINFECTANT EMPLOYING DUAL CHAIN QUATERNARY AMMONIUM COMPOUNDS WITH IODINE

Howard Martin, 11500 W. Hill Dr., Rockville, Md. 20852

Provisional application No. 60/063,429, Oct. 28, 1997. This application Oct. 27, 1998, Appl. No. 179,795.

Int. Cl.[7] A61K *33/18*;*31/14*

U.S. Cl. 514—642 13 Claims

1. A composition for disinfecting and sanitizing surfaces and for de-germing of skin, comprising the following in combination:

a dual chain quaternary ammonium compound;

iodine of at least 50 ppm for rapid germicidal action;

potassium iodide complexed with said iodine to act as a solubilizing agent;

alcohol to enhance the rapid germicidal action of the iodine;

ethoxylated nonylphenol; and
deionized water;
whereby said composition has an acidic pH level to improve stability.

6,015,837

METHOD FOR TREATING SCOLIOSIS WITH β2-ADRENOCEPTOR AGONISTS

Joseph D. Etlinger, Mt. Kisco, and Richard J. Zeman, New York, both of N.Y., assignors to New York Medical College, Valhalla, N.Y.

Provisional application No. 60/025,147, Aug. 29, 1996. This application Aug. 26, 1997, Appl. No. 920,018.
Int. Cl.[7] A01N *33/02;* **A61K** *31/135*
U.S. Cl. 514—653 **12 Claims**

1. A method for treating scoliosis which comprises administering to a patient with scoliosis at least one β_2-adrenergic agonist selected from the group consisting of clenbuterol, albuterol, salmeterol, ractopamine, salbutamol, cimaterol, BRL-47672, terbutaline, fenoterol, metaproterenol, isopraline, MJ-9184-1, trimetoquinol, tetrahydropapaveroline, soterenol, salmefarnol, rimiterol, QH-25, isoetharine, R-804, orciprenaline, quinterenol, sulfonterol, dobutamine, and isoproterenol and salts of the foregoing in an amount effective to reduce the scoliosis.

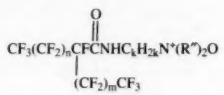
6,015,838

AQUEOUS FILM-FORMING FOAM COMPOSITIONS

Richard M. Stern, Woodbury, and Wei-Qiang Fan, Cottage Grove, both of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Nov. 4, 1996, Appl. No. 743,478
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B01F *17/00;* **A62D** *1/04*
U.S. Cl. 516—12 **5 Claims**

1. An aqueous film-forming foamable composition comprising one or more surfactants of the formula



wherein
n is between 4 and about 18 inclusive;
m is between 0 and about 9 inclusive;
k is between 2 and 6 inclusive; and
R" is a lower alkyl group having from 1 to 4 carbon atoms or may combine with the depicted nitrogen atom to from a pyridinyl, piperidino or morpholino heterocyclic ring.

6,015,839

ANTI-FOAMING COMPOSITION

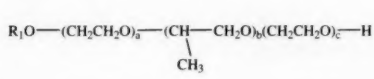
Alain Milius, Nice, France, assignor to Societe d'Exploitation de Produits pour les Industries Chimiques SEPPIC, Paris Cedex, France

PCT No. PCT/FR96/00600, § 371 Date Jul. 3, 1997, § 102(e) Date Jul. 3, 1997, PCT Pub. No. WO96/33255, PCT Pub. Date Oct. 24, 1996
PCT Filed Apr. 19, 1996, Appl. No. 860,101
Claims priority, application France, Apr. 21, 1995, 95 04827
Int. Cl.[7] B01D *19/04;* **C11D** *1/72*
U.S. Cl. 516—134 **3 Claims**

1. An anti-foaming composition comprising: a nonionic defoaming surfactant and an alkylpolyglycoside of formula (I):

$$R\,(O)\,Z_n$$

in which:
R represents a 2-ethylhexyl radical,
Z is a sugar residue, and
n is between 1 and 5;
wherein said nonionic defoaming surfactant is a compound of formula (II);



(II)

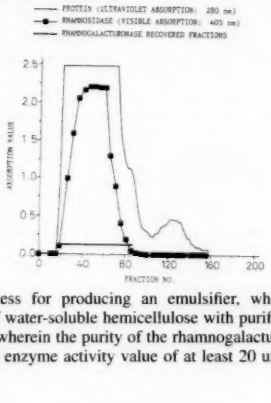
in which:
R_1 is a linear or branched alkyl radical comprising 6 to 14 carbon atoms; and
a=2, b=4, and c=2.

6,015,840

PROCESS FOR PRODUCING EMULSIFIERS, AND EMULSIFIED COMPOSITIONS

Akihiro Nakamura; Masayoshi Kato; Taro Takahashi, and Hirokazu Maeda, all of Tsukuba-gun, Japan, assignors to Fuji Oil Co., Ltd., Osaka, Japan

PCT No. PCT/JP97/01921, § 371 Date Feb. 4, 1998, § 102(e) Date Feb. 4, 1998, PCT Pub. No. WO97/46312, PCT Pub. Date Dec. 11, 1997
PCT Filed Jun. 6, 1997, Appl. No. 11,374
Claims priority, application Japan, Jun. 7, 1996, 8-145823
Int. Cl.[7] B01F *3/00;* **A23L** *1/222;* **D21C** *1/00*
U.S. Cl. 516—270 **2 Claims**



1. A process for producing an emulsifier, which comprises hydrolysis of water-soluble hemicellulose with purified rhamnogalacturonase, wherein the purity of the rhamnogalacturonase is such as to give an enzyme activity value of at least 20 units/mg.

6,015,841

INITIATOR SYSTEMS CONTAINING VANADIUM TETRACHLORIDE FOR THE (CO)POLYMERIZATION OF ISOOLEFINS

Gerhard Langstein, Kürten; Martin Bohnenpoll, Leverkusen; Uwe Denninger, Bergisch Gladbach; Werner Obrecht, Moers, all of Germany, and Peter Plesch, North Staffordshire, United Kingdom, assignors to Bayer AG, Germany

Filed Jun. 30, 1997, Appl. No. 884,969
Claims priority, application Germany, Jul. 9, 1996, 196 27 529
Int. Cl.[7] C08F *2/50;4/20;10/04*
U.S. Cl. 522—29 **20 Claims**

1. An initiator system comprising one or more aromatic or heteroaromatic, polycyclic hydrocarbons and a solution of vanadium tetrachloride aged for an efficient amount of time in an organic solvent, wherein the vanadium tetrachloride solution has a concentration of about 0.01 to 500 mmol per liter of the organic solvent and wherein the aged vanadium tetrachloride solution and

the one or more polycyclic hydrocarbons are present in the initiator system in a molar ratio of about 100:1 to 1:100.

6,015,842

METHOD OF PREPARING FOLDABLE HYDROPHILIC OPHTHALMIC DEVICE MATERIALS

Albert R. LeBoeuf, and Mutlu Karakelle, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Aug. 7, 1997, Appl. No. 910,966

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C08F *2/50;20/18;26/10;20/10*

U.S. Cl. 522—64 **15 Claims**

1. A method of preparing a foldable, acrylic, high refractive index ophthalmic material comprising the steps of:

a) preparing a device-forming mixture comprising a benzoylphosphine oxide photoinitiator, an UV-absorbing chromophore and one or more hydrophilic device-forming monomers selected from the group consisting of: 2-hydroxyethylmethacrylate; 2-hydroxyethylacrylate; N-vinylpyrrolidone; glyceryl methacrylate; glyceryl acrylate; polyethylene oxide mono and dimethacrylates; and polyethylene oxide mono- and diacrylates; and

b) exposing the mixture to a blue-light source for a period of time sufficient to cure the device forming mixture.

6,015,843

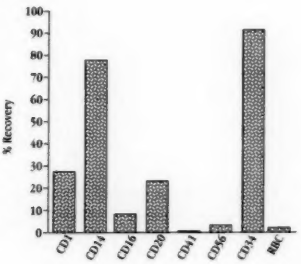
PROCESS FOR MAKING SILANIZED COLLOIDAL SILICA

Peter Van Vlasselaer, and Shirin W. Hasan, both of Sunnyvale, Calif., assignors to Dendreon Corporation, Seattle, Wash.

Filed Jan. 14, 1998, Appl. No. 6,775

Int. Cl.[7] C08J *3/28;3/24;* **C08K** *9/06*

U.S. Cl. 522—84 **10 Claims**



1. A method of bulk preparation of a stable organosilanized colloidal silica suspension in an aqueous environment, comprising

providing an aqueous organosilane solution having a pH in the range of about 2–3 and heated to about 80 degrees C. for about 1 hour,

adding to said organosilane solution, a colloidal silica suspension to form an organosilane-colloidal silica mixture having a final concentration of between about 5 and about 10 organosilane;

adjusting the pH of said organosilane-colloidal silica mixture to a pH greater than about 6.0;

curing said suspension for a period of time effective to produce a stable colloidal suspension, as evidenced by lack of precipitate formation in the presence of physiological salt or acid,

wherein said resulting stable colloidal silica suspension is aqueous and non-toxic to cells.

6,015,844

COMPOSITE SURGICAL MATERIAL

Wilson Harvey, Sterling; Nicholas D. Light, Doune Perthshire, and Carla A. Haynes, Glasgow, all of United Kingdom, assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Continuation-in-part of application No. 08/437,905, May 10, 1995, Pat. No. 5,660,857, which is a division of application No. 08/035,001, Mar. 22, 1993, abandoned, and a division of application No. 08/280,916, Jul. 27, 1994, Pat. No. 5,789,465. This application Dec. 19, 1997, Appl. No. 995,228.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *38/00;* **A61F** *2/00*

U.S. Cl. 523—113 **10 Claims**

1. A surgical graft or prosthesis comprising:

a matrix of insoluble collagen reinforced by a layer of a synthetic bioabsorbable material and having oil droplets dispersed in the collagen matrix.

6,015,845

BINDER FOR BUILDING STRUCTURE

Masayuki Yonetani, and Seiji Nishida, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP96/03271, § 371 Date Jun. 1, 1998, § 102(e) Date Jun. 1, 1998, PCT Pub. No. WO98/20085, PCT Pub. Date May 14, 1998

PCT Filed Nov. 7, 1996, Appl. No. 77,537

Claims priority, application Japan, Nov. 16, 1995, 7-298380

Int. Cl.[7] C09J *4/00;163/10*

U.S. Cl. 523—130 **6 Claims**

1. A binder for a building structure comprising a main ingredient, a curing agent and an accelerator for the main ingredient; the main ingredient being an epoxy acrylate resin diluted with a reactive monomer comprising a multifunctional ester of carboxylic acid and alcohol, at least one of which contains a reactive double bond; the curing agent being an organic peroxide; and the accelerator of the main ingredient being tertiary aromatic amines containing a hydroxyl group in a nitrogen substituent.

6,015,846

METHOD OF IMPROVING THE PROPERTIES OF RECLAIMED SAND USED FOR THE PRODUCTION OF FOUNDRY MOULDS AND CORES

Philippe Marie Toussaint, Saint Martin-de-Boscherville; Patrick Robert Queval, Duclair, both of France; Johannes-Adolf-Jacobus Geraedts, Roggel, Netherlands, and Jacques Andre Caumont, Le-Grande-Ouevilly, France, assignors to Borden France S.A., Deville-Les-Rouen, France

PCT No. PCT/GB94/01005, § 371 Date Dec. 29, 1995, § 102(e) Date Dec. 29, 1995, PCT Pub. No. WO94/26439, PCT Pub. Date Nov. 24, 1994

PCT Filed May 10, 1994, Appl. No. 532,807

Claims priority, application United Kingdom, May 11, 1993, 9309615

Int. Cl.[7] B22C *1/18*

U.S. Cl. 523—142 **29 Claims**

1. A composition for use in the manufacture of foundry molds and cores which comprises a mixture of a particulate refractory aggregate with, as an additive thereto, a particulate clay characterized in that the particulate refractory aggregate comprises sand recovered from spent foundry molds and cores, and optionally new sand, which contains one or more alkali metal salts capable of reacting with the particulate clay and in that the particulate clay is capable of reacting with the alkali metal salts contained in the particulate refractory aggregate such that reaction occurs between the particulate clay and the alkali metal salts when mixed together and wherein the particulate clay has a particle size of less than 0.5 mm and is present in an amount of from 0.05 to 5% by weight based on the weight of the recovered sand.

6,015,847

MAGENTA PHASE CHANGE INK FORMULATION CONTAINING ORGANIC SULFONIC ACID

Donald R. Titterington, Tualatin; Michael B. Meinhardt, Salem; Jeffery H. Banning, Hillsboro, and Clifford R. King, Salem, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Feb. 13, 1998, Appl. No. 23,816

Int. Cl.[7] **C09D** *11/02;11/10;175/04;* **C08K** *5/42;* **C08L** *75/04*

U.S. Cl. 523—160 **22 Claims**

1. A phase change ink composition comprising in combination:

(a) a phase change carrier composition;

(b) at least one compatible phase change magenta dye colorant material; and

(c) at least one organic sulfonic acid compound.

6,015,848

COATING COMPOSITION AND METHOD FOR APPLICATION THEREOF

Satoshi Ikushima, Kashihara; Seiji Wada, Hiratsuka; Yasumasa Okumura, Yokohama; Haruhiko Aida, Hiratsuka; Motoshi Yabuta, Hadano; Yoshiyuki Yukawa, and Ken-ichi Hasada, both of Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo-ken, Japan

Filed Dec. 5, 1997, Appl. No. 985,907

Claims priority, application Japan, Dec. 5, 1996, 8-339091; Jan. 31, 1997, 9-019022; Jan. 31, 1997, 9-019023; Jan. 31, 1997, 9-031497; Mar. 7, 1997, 9-068962; Mar. 26, 1997, 9-089944; Jun. 26, 1997, 9-184623; Aug. 11, 1997, 9-228868; Aug. 15, 1997, 9-233284

Int. Cl.[7] **C08L** *63/00;83/04;* **C08J** *3/28*

U.S. Cl. 523—427 **35 Claims**

1. A thermosetting organic solvent coating composition capable of forming a cured coating film having a TUKON hardness at 20° C. of 15 or more when a coating of the composition is applied on a glass plate so as to give a film having a thickness of 30 μm as cured, and the resulting film is heat-cured at 140° C. for 30 minutes; and a minimum value of dynamic modulus E' at a frequency of 110 Hz in the temperature range of 150–200° C., of 1×10^9 dyn/cm^2 or more, which comprises:

(A) a compound containing at least 2 alicyclic epoxy groups in the molecule and having a number-average molecular weight of smaller than 2,000,

(B) an epoxy group-containing acrylic resin having a number-average molecular weight of 2,000–50,000, a hydroxyl value of 10–150 mg KOH/g and an epoxy equivalent of 220 or less,

(C) a thermoinitiated cationic polymerization catalyst, and

(D) a fluorine-containing resin,

wherein the molar ratio of the epoxy groups of the component (A) to the epoxy groups of the component (B) is 1:1 to 1:0.05.

6,015,849

SYNERGISTIC STABILIZER MIXTURE

François Gugumus, Allschwil, Switzerland, assignor to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

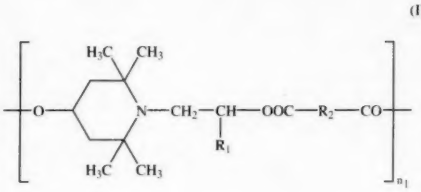
Continuation of application No. 08/588,164, Jan. 18, 1996, abandoned. This application Apr. 21, 1997, Appl. No. 858,191.

Claims priority, application European Pat. Off., Jan. 23, 1995, 95810042

Int. Cl.[7] **C08K** *5/34*

U.S. Cl. 524—100 **11 Claims**

1. A stabilizer mixture comprising a component a) and a component b), c) or d), where component a) is at least one compound of the formula I



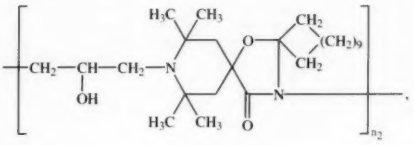
(I)

in which R_1 is hydrogen or methyl,

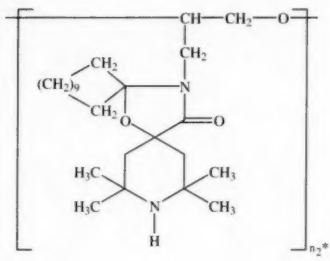
R_2 is a direct bond or C_1–C_{10} alkylene and

n_1 is a number from 2 to 50;

component b) is at least one compound of the formulae IIa and IIb



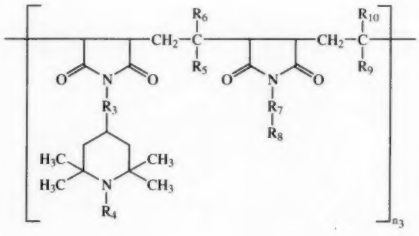
(IIa)



(IIb)

in which n_2 und n_2* are a number from 2 to 50;

component c) is at least one compound of the formula III

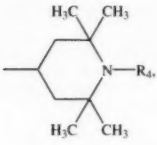


(III)

in which R_3 and R_7, independently of one another, are a direct bond or an —N(X_1)—CO—X_2—CO—N(X_3)— group, where X_1

and X_3, independently of one another, are hydrogen, C_1–C_8 alkyl, C_5–C_{12} cycloalkyl, phenyl, C_7–C_9 phenylalkyl or a group of the formula IV

(IV)



and X_2 is a direct bond or C_1–C_4 alkylene,

R_4 is hydrogen, C_1–C_8 alkyl, $O^{\cdot}$, $—CH_2CN$, C_3–C_6 alkenyl, C_7–C_9 phenylalkyl, C_7–C_9 phenylalkyl which is substituted by C_1–C_4 alkyl on the phenyl radical, or C_1–C_8 acyl,

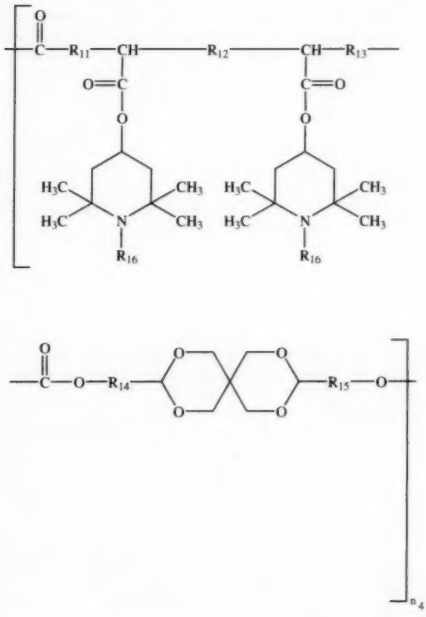
R_5, R_6, R_9 and R_{10}, independently of one another, are hydrogen, C_1–C_{30} alkyl, C_5–C_{12} cycloalkyl or phenyl,

R_8 is hydrogen, C_1–C_{30} alkyl, C_5–C_{12} cycloalkyl, C_7–C_9 phenylalkyl, phenyl or a group of the formula IV, and

n_3 is a number from 1 to 50; and

component d) is at least one compound of the formula V

(V)



in which R_{11}, R_{12}, R_{13}, R_{14} and R_{15}, independently of one another, are a direct bond or C_1–C_{10} alkylene, R_{16} is as defined for R_4, and n_4 is a number from 1 to 50;

a weight ratio between component a) and component b), c) or d) being about 20:1 to about 1:20.

6,015,850

RUBBER COMPOSITION

Masao Nakamura, and Yukio Takagishi, both of Kanagawa, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/00717, § 371 Date Sep. 17, 1997, § 102(e) Date Sep. 17, 1997, PCT Pub. No. WO96/29364, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 18, 1996, Appl. No. 913,413

Claims priority, application Japan, Mar. 17, 1995, 7-086286

Int. Cl.[7] **C08K** *5/54*

U.S. Cl. 524—188 **22 Claims**

1. A rubber composition comprising a diene rubber, silica and silicone oil, wherein (i) silica having a specific surface area ranging from 120 to 190 m^2/g as determined by nitrogen absorption (BET method) is present in a proportion of 10–150 parts by weight per 100 parts by weight of the diene rubber, and (ii) silicone oil having a polar group at its side chain or terminal is present in a proportion of 0.1–50 parts by weight per 100 parts by weight of the silica.

6,015,851

RUBBER COMPOSITIONS CONTAINING BIS ANIL COMPOUNDS

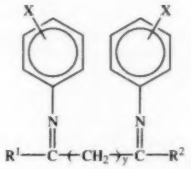
Neil Arthur Maly, Tallmadge; Lawson Gibson Wideman, Hudson, and Lewis Timothy Lukich, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 17, 1998, Appl. No. 98,800

Int. Cl.[7] **C08L** *41/00*

U.S. Cl. 524—243 **18 Claims**

1. A rubber composition comprising an elastomer containing olefinic unsaturation and a bis anil compound of the formula



where R^1 and R^2 may be the same or different and are independently selected from alkyls having from 1 to 5 carbon atoms and X is selected from the group consisting of H; OH; OAlk where Alk is an alkyl having from 1 to 3 carbon atoms; COOH and; COO^-M^+ where M is a metal selected from the group consisting of Zn, Na, Ca and Mg; and y is 0 to 2.

6,015,852

SURFACE TENSION REDUCTION WITH ALKYLATED HIGHER POLYAMINES

Kevin Rodney Lassila, Macungie; Kristen Elaine Minnich, and Richard Van Court Carr, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 12, 1997, Appl. No. 968,222

This patent is subject to a terminal disclaimer.

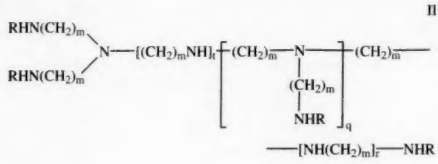
Int. Cl.[7] **C08J** *3/03*

U.S. Cl. 524—251 **24 Claims**

1. In a method for applying a water-based composition to a surface, the composition containing an organic compound and an effective amount of a surfactant low foaming for reducing the dynamic surface tension of the composition, the improvement which comprises employing as the surfactant at least one alkylated polyamine compound of the following structures I and II

$$RHN—[(CH_2)_nNH]_p—(CH_2)_nNHR \quad \text{I}$$

where the R groups are independently hydrogen or C5 to C8 alkyl, provided that at least one R is not hydrogen; n is 2 to 6 and p is 2 to 8, and



where the R groups are independently hydrogen or C5 to C8 alkyl, provided at least one R is not hydrogen, m is 2 to 6, t is 0 to 3, q is 0 to 3, and r is 0 to 5.

6,015,853

LIQUID INJECTION MOLDING INHIBITORS FOR CURABLE COMPOSITIONS

Philip J. McDermott, Albany; Michael J. O'Brien, Clifton Park, and Edward M. Jeram, Burnt Hills, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of application No. 08/588,594, Jan. 18, 1996, which is a division of application No. 08/096,314, Jul. 23, 1993, Pat. No. 5,506,289. This application Nov. 13, 1997, Appl. No. 969,388.

Int. Cl.[7] C08K *5/36;5/24*

U.S. Cl. 524—303 **28 Claims**

1. A process for stabilizing a moldable and polymerizable or curable resin or mixtures thereof comprising selecting one or more compounds, oligomers, resins or fluids from the group consisting of MT, MDT, MDQ, MTQ, MDTQ, and MQ polyorganosiloxanes and contacting said selected polyorganosiloxanes with a liquid injection molding inhibitor compound having the formula:

$$R_1O_2C—CH=CH—CO_2R_2$$

wherein R_1 is an organic moiety containing at least two carbon atoms triply bonded one to the other as:

$$—C\equiv C—$$

and R_2 is hydrogen, an organic moiety, or R_1.

6,015,854

POLYPROPYLENE IMPACT COPOLYMERS WITH HIGH CLARITY

James Douglas McCullough, Jr., Houston, Tex., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Oct. 24, 1997, Appl. No. 957,418

Int. Cl.[7] C08J *5/36*

U.S. Cl. 524—396 **11 Claims**

1. An impact copolymer having a melt flow of about 1 to about 100 dg/min comprising an in situ blend of a polypropylene phase and a copolymerized ethylene and propylene rubber phase formed by copolymerizing ethylene and propylene in the presence of a polypropylene phase, whereby the polypropylene phase may contain up to two weight percent of another olefin, the impact copolymer comprising about 3 to about 60 weight percent of rubber phase with an ethylene content of about 75 to about 95 weight percent, a clarifying agent, and the remainder propylene wherein the copolymer has a clarity of greater than about 20% according to ASTM D-1746-92, the copolymer is cracked to a cracking ratio of between about 1.5 to about 2.5, and the flexural modulus of the impact copolymer is more than 90% of the flexural modulus of the same impact copolymer that has not been cracked.

6,015,855

PAINT FORMULATIONS

William M. Dalton, Moberly, Mo., assignor to Elisha Technologies Co LLC, Moberly, Mo.

Provisional application No. 60/036,025, Jan. 31, 1997, Provisional application No. 60/045,465, May 2, 1997. This application Jan. 30, 1998, Appl. No. 16,497.

Int. Cl.[7] C08K *3/34;11/00;* **C08L** *63/00*

U.S. Cl. 524—442 **23 Claims**

1. An improved epoxy paint formulation comprising about 1 to about 10 wt. % of at least one silicate, water, and amount of at least one an acidic material or a precursor thereof in an amount effective to reduce the pH of the paint.

6,015,856

COMPOSITE RESIN MATERIAL AND METHOD OF FORMING THE SAME

Mitsumasa Matsushita; Takumi Taniguchi; Takashi Ohta; Norio Sato; Yuji Hoshino, all of Nagoya; Kanemitsu Kondo, Anjo; Naruaki Abe, and Toshiyuki Suzuki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 8, 1996, Appl. No. 746,347

Claims priority, application Japan, Nov. 10, 1995, 7-293003; May 9, 1996, 8-114895

Int. Cl.[7] C08J *3/34;* **C08K** *3/34*

U.S. Cl. 524—451 **15 Claims**

1. A composite resin material comprising:

(a) a matrix of at least one of a nonreactive resin and a polymer alloy of said nonreactive resin with a rubber;

(b) particles of a hydrolysis product of a crosslinked polyurethane resin having a melt viscosity at a kneading and molding temperature lower than the melt viscosity of said nonreactive resin, or said polymer alloy, at said kneading and molding temperature and wherein the crosslinks of said polyurethane resin are partly cut and partly maintained, the particles of said hydrolysis product being dispersed in said matrix; and

(c) particles of a solid filler forming a core within the particles of said hydrolysis product,

wherein each of said nonreactive resin and polymer alloy thereof is a resin which has no functional groups reactable with crosslinks of the crosslinked polyurethane resin or with active groups of the hydrolysis product resulting from hydrolysis thereof, and which is meltable by heating.

6,015,857

PROPYLENE RESIN COMPOSITIONS

Yoshihiro Sobajima; Masashi Shimouse; Masahide Hamaura, and Akira Yamaji, all of Yokkaichi, Japan, assignors to Japan Polychem Corporation, Tokyo-to, Japan

Filed Nov. 12, 1997, Appl. No. 968,345

Claims priority, application Japan, Nov. 26, 1996, 8-314709

Int. Cl.[7] C08L *53/00;23/00*

U.S. Cl. 524—451 **8 Claims**

1. A propylene resin composition consisting essentially of

component (a) which is a propylene-ethylene block copolymer comprising 85–95% by weight of a crystalline polypropylene homopolymer portion (unit A) and 5–15% by weight of an ethylene-propylene random copolymer portion (unit B) having an ethylene content of 30–60% by weight, the melt flow rate of the total component (a) being 50– 500 g/10 min at 230° C. and 2.16 kg, in an amount of 100 parts by weight;

component (b) which is talc having an average particle diameter of 1.5–10 μm and an average aspect ratio of 4 or more, in an amount of 10–60 parts by weight; and

component (c) which is an ethylene-1-octene copolymer comprising 20–50% by weight of 1-octene units, and having a density of 0.86–0.89 g/cm^3 and a tensile strength at break of 10 MPa or more in an amount of 10– 60 parts by weight.

6,015,858

THERMOPLASTIC SILICONE ELASTOMERS BASED ON FLUOROCARBON RESIN

Gerald Alphonse Gornowicz, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 8, 1998, Appl. No. 149,267

Int. Cl.[7] C08L *47/00;27/12;51/08;83/04;43/04*

U.S. Cl. 524—545 **22 Claims**

1. A method for preparing a thermoplastic elastomer, said method comprising:

(I) reacting

(A) a fluorocarbon resin with

(B) a grafting agent selected from the group consisting of

(B') an organic compound which contains at least 2 olefinic groups,

(B") a organopolysiloxane having a viscosity of less than 5,000 mPa-s at 25° C. and containing at least 2 olefin groups and

(B'") a silane having at least one olefinic group and at least one silicon-bonded moiety selected from the group consisting of a hydrolyzable group and a hydroxyl group, in the presence of

(C) a radical initiator,

to prepare a modified fluorocarbon resin;

(II) mixing said modified fluorocarbon resin with

(D) a silicone base comprising

(D') a diorganopolysiloxane having a plasticity of at least 30 and having an average of at least 2 alkenyl radicals in its molecule and

(D") 10 to 200 parts by weight of a reinforcing filler for each 100 parts by weight of said diorganopolysiloxane (D'),

(E) an organohydrido silicon compound which contains an average of at least 2-silicon-bonded hydrogen groups in its molecule, and

(F) a hydrosilation catalyst,

components (E) and (F) being present in an amount sufficient to cure said diorganopolysiloxane; and

(III) dynamically curing said diorganopolysiloxane,

wherein the amount of said diorganopolysiloxane base (B) used is such that at least one property of said thermoplastic elastomer selected from tensile strength or elongation is at least 25% greater than the respective property for a corresponding composition wherein said fluorocarbon resin is not modified,

with the proviso that said thermoplastic elastomer has an elongation of at least 25%.

6,015,859

THERMOPLASTIC POLYMER MIXTURE WITH IMPROVED MECHANICAL PROPERTIES

Yves Camberlin, Caluire; Serge Gonzalez, Decines, and Frédérique Hauviller, Saint Genis Laval, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Mar. 23, 1998, Appl. No. 45,720

Claims priority, application France, Mar. 24, 1997, 97 03555

Int. Cl.[7] C08L *63/00;23/00;23/36*

U.S. Cl. 525—112 **25 Claims**

1. A thermoplastic polymer composition containing at least two distinct polymers, comprising at least one polymer P1 containing at least one reactive function and a least one modified polyolefin P2 containing at least one succinimide ring substituted on the nitrogen by a reactive group, wherein the modified polyolefin is the product of the reaction of at least one polyolefin, at least one compound containing a maleimide ring substituted on the nitrogen by a reactive group with formula $OR—(X)_n$, where X represents a reactive group, n is a positive whole number equal to 1 or more and R is a residue containing at least one carbon atom, and at least one polyepoxide containing at least two epoxy groups in its molecule.

6,015,860

ACRYLIC ELASTOMER COMPOSITION

Yoshihiro Kuzumaki; Iwao Moriyama, and Jun Okabe, all of Kitaibaraki, Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan

Filed Aug. 13, 1998, Appl. No. 133,862

Claims priority, application Japan, Sep. 26, 1997, 9-279958; Mar. 13, 1998, 10-082593

Int. Cl.[7] C08L *33/08*

U.S. Cl. 525—123 **11 Claims**

1. An acrylic elastomer composition, which comprises a carboxyl group-containing acrylic elastomer, a polyfunctional isocyanate compound, and at least one of a guanidine, a quaternary onium salt, a tertiary amine and a tertiary posphine as a vulcanization accelerator.

6,015,861

METHOD FOR MANUFACTURE OF ELASTOMERIC ALLOYS USING RECYCLED RUBBERS

Elaine A. Mertzel, Northville, Mich.; Ronald G. Weber, Toledo, Ohio, and Louis Citarel, Southfield, Mich., assignors to The Standard Products Company, Cleveland, Ohio

Filed Dec. 17, 1997, Appl. No. 992,547

Int. Cl.[7] C08L *9/00;23/00;* **C08F** *8/00;* **C08C** *8/00*

U.S. Cl. 525—232 **14 Claims**

1. A method of preparing a rubber-blend thermoplastic composition, comprising the steps of:

(a) providing a ground crosslinked rubber having an average particle size of about 80 mesh or smaller; and

(b) combining the ground crosslinked rubber with a thermoplastic polyolefinic material and a compatibilizer based on a paraffinic oil to form a blend thermoplastic resin composition.

6,015,862

FUNCTIONALIZED α-OLEFIN/PARA-ALKYLSTYRENE TERPOLYMERS

Tze-Chiang Chung, State College, Pa., and Honglan Lu, Port Lavaca, Tex., assignors to The Penn State Research Foundation, University Park, Pa.

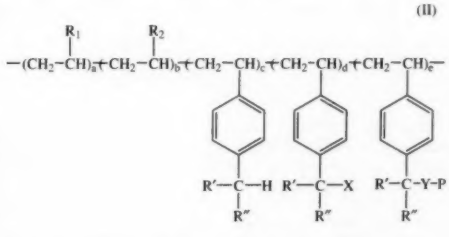
Continuation-in-part of application No. 08/671,990, Jun. 28, 1996, Pat. No. 5,866,659, which is a continuation-in-part of application No. 08/341,778, Nov. 18, 1994, Pat. No. 5,543,484. This application Oct. 23, 1998, Appl. No. 178,308.

Int. Cl.[7] C08F *257/02*

U.S. Cl. 525—320 **25 Claims**

1. A functionalized terpolymer of two different α-olefins having form 2to 12 carbon atoms and para-alkylstyrene, said functionalized terpolymer having a substantially homogeneous compositional distribution represented by the formula:

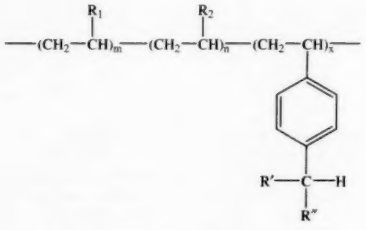
(II)



in which R_1, R_2, R' and R", independently, are hydrogen or C_1 to C_{10} linear or branched alkyl group, with the proviso that R_1 is not the same as R_2; X is a functional group; P is a polymer having a molecular weight of at least 500, which can be derived from both step and chain polymerization reactions; Y is a chemical linkage between polymer P and para-alkylstyrene side chain, which is also

a residue derived from a graft reaction; and the combination of a+b+c+d+e represents the empirical formula of a substantially random functional polymer; where both a and b are greater than 0, where the sum of a+b ranges from about 50 to 100,000; where each of c, d and e range from 0 to 10,000; where both d and e can not be 0, and where the sum of c+d+e is at least 1; and wherein said functionalized terpolymer has been derived from an initial terpolymer having a substantially homogeneous compositional distribution and having been prepared in the presence of a transition metal coordination catalyst, said initial terpolymer being represented by the formula

(I)



where R_1, R_2, R' and R" are defined above; where the combined α-olefin mole % (m+n) is between about 5 and 99.9; where the sum of m+n+x (mole % of p-alkylstyrene, is 100; and where the initial terpolymer has a number average molecular weight (Mn) of at least 1,000 and a ration of weight average molecular weight (Mw) to number average molecular weight of less than 8.

6,015,863

POLYMERIC MANNICH ADDITIVES

Carl Anthony Mike, Chesterfield; Gregory Paul Anderson, Glen Allen, and Carl Kurt Esche, Jr., Richmond, all of Va., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 2, 1998, Appl. No. 54,029

Int. Cl.[7] C08F *10/00*

U.S. Cl. 525—333.7 **53 Claims**

1. An ashless dispersant comprising the reaction products of the following reactants:

1) at least one Mannich base condensation product of a hydrocarbyl hydroxy aromatic compound with an aldehyde and an amine, with

2) at least one poly(a-olefin-unsaturated acidic reagent), and

3) optionally the reaction products of reactants 1) and 2) above with amines, alcohols, amino alcohols, or mixtures thereof, and

4) optionally the post-treatment of above reaction products with at least one member selected from the group consisting of organic or inorganic phosphorus compounds or any partial or total sulfur analogs thereof, boronating agents and acylating agents.

6,015,864

THERMOSETTING POWDER COATING COMPOSITION

Martinus Adrianus Anthonius Maria Koenraadt, Duiven; Arie Noomen, Voorhout; Keimpe Jan Van Den Berg, Sassenheim; Josephus Christiaan Van Oorschot, Arnhem, and Huig Klinkenberg, Katwijk aan Zee, all of Netherlands, assignors to Akzo Nobel NV, Arnhem, Netherlands

Continuation of application No. PCT/EP96/05026, Nov. 12, 1996. This application May 21, 1998, Appl. No. 83,074.

Int. Cl.[7] C08C *19/30*

U.S. Cl. 525—385 **15 Claims**

1. A thermosetting powder coating composition comprising a polymer reactive towards oxetane groups and an oxetane groups-containing cross-linking agent having an oxetane functionality of more than 1, wherein said oxetane groups-containing cross-linking agent is obtained by reacting a functional group-containing oxetane with a compound having at least two groups reactive towards said functional group.

6,015,865

HOT MELT ADHESIVE FROM EPOXY RESIN/AMINE-TERMINATED POLYALKYLENE GLYCOL ADDUCT

Norman E. Blank, Heidelberg, and Hubert K. Schenkel, Sandhausen, both of Germany, assignors to Henkel-Teroson GmbH, Heidelberg, Germany

Continuation of application No. 07/721,045, Jun. 26, 1991, abandoned. This application Oct. 22, 1997, Appl. No. 956,766.

Int. Cl.[7] C08G *59/14;* **C08L** *63/02;* **C09J** *163/02*

U.S. Cl. 525—524 **8 Claims**

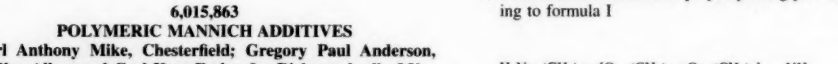
1. A reactive hot melt adhesive composition comprising the reaction product of a thermally activatable latent curing agent with

(a) about 0.5 to about 1 equivalent of an epoxy resin which is solid at room temperature prepared from bisphenol A or bisphenol F and epichlorohydrin having an epoxide equivalent weight of from about 400 to about 700,

(b) about 0.5 to about 1 equivalent of an epoxy resin which is liquid at room temperature prepared from bispbenol A or bisphenol F and epichlorohydrin having an epoxide equivalent weight of from about 150 to about 220, and

(c) about 0.125 to about 0.5 equivalent of an amino-terminated polyalkylene glycol selected from the group consisting of polyethylene and polypropylene glycols, wherein said epoxy resins (a) and (b) are present in an amount such that a stoichiometric excess of at least 1 equivalent of epoxy groups over the amino groups is provided, said amino-terminated polyalkylene glycol comprising

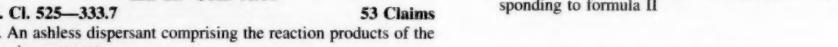
i) a linear amino-terminated polyethylene glycol corresponding to formula I



(I)

wherein n is a number from about 17 to about 27 or

ii) a linear amino-terminated polypropylene glycol corresponding to formula II

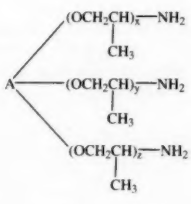


(II)

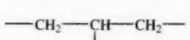
wherein n is 40 to 200, with an average molecular weight of >2000, or,

iii) a linear amino-terminated polyethylene glycol of the formula I in which n=17 to 27, or a linear amino-terminated polypropylene glycol of the formula II, in which n is 5 to 200, with an average molecular weight of >360, together with a trifunctional amino-terminated polypropylene glycol of the formula III

(III)



in which A is a $—CH_3CH_2C(CH_2)_3$ or a



group and x, y and z independently of each other are 1 to 40, with an average molecular weight of >400, and wherein 4 to 40% of the epoxy equivalents of the total epoxy resin component are replaced by (a) an adduct of dimeric fatty acids on epoxy resins prepared from diglycidyl ethers of bisphenol A or F, or (b) an adduct of carboxyl-terminated butadiene-nitrile rubber on epoxy resins prepared from diglycidyl ethers of bisphenol A or F.

6,015,866

PRODUCTION OF POLYETHYLENE HAVING A BIMODAL MOLECULAR WEIGHT DISTRIBUTION

Guy Debras, Frasnes-lez-Gosselies, and Jean-Pierre Dath, Beloeil, both of Belgium, assignors to Fina Research, S.A., Feluy, Belgium

Filed Dec. 22, 1997, Appl. No. 996,256

Claims priority, application European Pat. Off., Dec. 20, 1996, 96120696

Int. Cl.[7] **C08F** *4/06*

U.S. Cl. 526—101 **19 Claims**

1. A process for producing high density polyethylene, the process comprising polymerizing ethylene, or copolymerizing ethylene and an alpha-olefinic comonomer comprising from 3 to 10 carbon atoms, in the presence of a catalyst system comprising first and second chromium-based catalysts, the first chromium-based catalyst having been reduced and reoxidised and the second chromium-based catalyst having been activated, fluoridized before or during the activation step, and reduced, the first and second chromium-based catalysts having a pore volume difference of at least 0.8 cc/g and the first chromium-based catalyst having a higher volume porosity than that of the second chromium-based catalyst.

6,015,867

3-ALKOXYPROPIONIC ESTER DERIVATIVE, OLEFIN POLYMERIZATION CATALYST, AND PROCESS FOR PREPARATION OF POLYOLEFIN

Masaki Fushimi, and Shintaro Inazawa, both of Oita, Japan, assignors to Showa Denko K.K., Toyko, Japan

Filed Sep. 28, 1995, Appl. No. 535,514

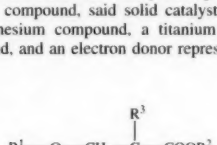
Claims priority, application Japan, Sep. 28, 1994, 6-259143; Nov. 18, 1994, 6-285249; Nov. 28, 1994, 6-293226

Int. Cl.[7] **C08F** *4/649;10/00*

U.S. Cl. 526—124.9 **12 Claims**

4. An olefin polymerization catalyst comprising (a) an olefin polymerization solid catalyst component and (b) an organoaluminum compound, said solid catalyst component (a) comprising a magnesium compound, a titanium compound, a halogen compound, and an electron donor represented by formula (I):

(I)

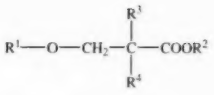


wherein R^1 represents a hydrocarbon group having from 1 to 10 carbon atoms; R^2 represents a hydrocarbon group having from 1 to 20 carbon atoms; R^3 represents a hydrocarbon group having from 1 to 20 carbon atoms; and R^4 represents a hydrocarbon group having 3 or more carbon atoms selected from the group consisting of isopropyl, isobutyl, isopentyl and cylcopentyl.

7. An olefin polymerization catalyst comprising:

(A) a solid catalyst component comprising a titanium compound, a magnesium compound, and a halogen compound; (B) an organoaluminum compound; and (C) an electron donor represented by formula (I):

(I)



wherein R^1 represents a hydrocarbon group having from 1 to 10 carbon atoms; R^2 represents a hydrocarbon group having from 1 to 20 carbon atoms; R^3 represents a hydrocarbon group having from 1 to 20 carbon atoms; and R^4 represents a hydrocarbon group having 3 or more carbon atoms selected from the group consisting of isopropyl, isobutyl, isopentyl and cyclopentyl.

6,015,868

SUBSTITUTED INDENYL CONTAINING METAL COMPLEXES AND OLEFIN POLYMERIZATION PROCESS

Peter N. Nickias; Mark H. McAdon; Jasson T. Patton, all of Midland, Mich.; Bernard P. Friedrichsen, Madison, Wis.; Jorge Soto, Midland, Mich.; James C. Stevens, Richmond, and Daniel D. VanderLende, Sugar Land, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US96/16012, § 371 Date Feb. 19, 1998, § 102(e) Date Feb. 19, 1998, PCT Pub. No. WO97/15583, PCT Pub. Date May 1, 1997

PCT Filed Oct. 3, 1996, Appl. No. 11,895

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C08F** *4/643;* **C07F** *17/00;* **B01J** *31/00*

U.S. Cl. 526—127 **21 Claims**

1. A metal complex corresponding to the formula:

wherein:

M is titanium, zirconium or hafnium in the +3 or +4 formal oxidation state;

A' is a substituted indenyl group substituted in at least the 2 or 3 position with a group selected from hydrocarbyl, fluoro-substituted hydrocarbyl, hydrocarbyloxy-substituted hydrocarbyl, dialkylamino-substituted hydrocarbyl, silyl, germyl and mixtures thereof, said group containing up to 40 nonhydrogen atoms, and said A' further being covalently bonded to M by means of a divalent Z group;

Z is divalent moiety bound to both A' and M via σ-bonds, said Z comprising boron, or a member of Group 14 of the Periodic Table of the Elements, and also comprising nitrogen, phosphorus, sulfur or oxygen;

X is an anionic or dianionic ligand group having up to 60 atoms exclusive of the class of ligands that are cyclic, delocalized, π-bound ligand groups;

X' independently each occurrence is a neutral Lewis base ligating compound, having up to 20 atoms;

p is 1 or 2, and is two less than the formal oxidation state of M, with the proviso that when X is a dianionic ligand group, p is 1; and

q is 0, 1 or 2.

9. A metal complex corresponding to the formula:

wherein:

M is titanium in the +2 formal oxidation state;

A' is a substituted indenyl group substituted in at least the 2 or 3 position with a group selected from hydrocarbyl, fluoro-substituted hydrocarbyl, hydrocarbyloxy-substituted hydrocarbyl, dialkylamino- substituted hydrocarbyl, silyl, germyl

and mixtures thereof, said group containing up to 40 nonhydrogen atoms, and said A' further being convalently bonded to M by means of a divalent Z group;

Z is a divalent moiety bound to both A' and M via σ-bonds, said Z comprising boron, or a member of Group 14 of the Periodic Table of the Elements, and also comprising nitrogen, phosphorus, sulfur or oxygen; and

X' is a neutral Lewis base ligating compound, having up to 20 atoms.

17. A coordination polymerization process comprising contacting one or more $C_{2\text{-}20}$ α olefins under polymerization conditions with a catalyst comprising an activating cocatalyst and a metal complex corresponding to the formula:

wherein:

M is titanium in the +2, +3 or +4 formal oxidation state;

A' is a substituted indenyl group substituted in at least the 2 or 3 position with a group selected from hydrocarbyl, fluoro-substituted hydrocarbyl, hydrocarbyloxy-substituted hydrocarbyl, dialkylamino- substituted hydrocarbyl, silyl, germyl and mixtures thereof, said group containing up to 40 nonhydrogen atoms, and said A' further being covalently bonded to M by means of a divalent Z group;

Z is a divalent moiety bound to both A' and M via σ-bonds, said Z comprising boron, or a member of Group 14 of the Periodic Table of the Elements, and also comprising nitrogen, phosphorus, sulfur or oxygen;

X is an anionic or dianionic ligand group having up to 60 atoms exclusive of the class of ligands that are cyclic, delocalized, π-bound ligand groups;

X' independently each occurrence is a neutral Lewis base ligating compound, having up to 20 atoms;

p is 0, 1 or 2, and is two less than the formal oxidation state of M, with the proviso that when X is a dianionic ligand group, p is 1; and

q is 0, 1 or 2;

and the activating cocatalyst comprises an alumoxane and trispentafluorophenylborane in a molar ratio from 1:1 to 5:1.

6,015,869

STRONGLY HYDROGEN-BOND ACIDIC POLYMER AND METHODS OF MAKING AND USING

Jay W. Grate, West Richland, and Steven N. Kaganove, Kennewick, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Mar. 17, 1998, Appl. No. 40,541

Int. Cl.[7] **C08G** *77/08*

U.S. Cl. 528—15 **27 Claims**

1. A polymer of a sorbent polymer or sorbent oligomer having a glass-to-rubber transition temperature below 25° C., comprising:

(a) a fluorinated bisphenol alternated with

(b) an oligosiloxane with

(c) a carbon chain connecting the fluorinated bisphenol with the oligosiloxane.

6,015,870

PROCESS FOR PREPARING POLYSULFIDE SILANES

Shoji Ichinohe; Hideyoshi Yanagisawa, and Akira Yamamoto, all of Usui-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1998, Appl. No. 161,290

Claims priority, application Japan, Sep. 26, 1997, 9-279656

Int. Cl.[7] **C08G** *77/22*

U.S. Cl. 528—30 **20 Claims**

1. A process for preparing polysulfide silanes, comprising reacting polysulfide silanes of formula (1)

$$(RO)_3SiC_3H_6S_xC_3H_6Si(OR)_3 \quad (1)$$

wherein R is methyl or ethyl, and x is a positive number of 3 to 6 on the average, with at least one anhydrous sulfur compound selected from sulfur compounds of formulae $M^1{}_2S$ and M^2S wherein M^1 is an alkali metal or ammonium and M^2 is an alkaline earth metal or zinc, and a halogenoalkoxysilane of general formula (2)

$$XC_3H_6Si(OR)_3 \quad (2)$$

wherein X is halogen and R is methyl or ethyl, to form polysulfide silanes of formula (3)

$$(RO)_3SiC_3H_6S_yC_3H_6Si(OR)_3 \quad (3)$$

wherein R is as defined above and y is a positive number less than x on the average.

6,015,871

LOW VOC ULTRA HIGH SOLIDS THERMOSETTING COATING COMPOSITION AND METHOD OF ITS PREPARATION

Homayoun Jamasbi, Blue Bell; Kenneth Everett Wohltmann, Lansdale, and Joseph John Spanier, Souderton, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Provisional application No. 60/048,749, Jun. 5, 1997. This application Jun. 1, 1998, Appl. No. 88,234.

Int. Cl.[7] **C08G** *18/40;18/62;* **C09D** *175/04;175/16*

U.S. Cl. 528—48 **4 Claims**

1. A low VOC ultra high solids thermosetting coating composition comprising:

a polymeric component which comprises a polymer and a reactive diluent, said polymer resulting from polymerization in the presence of said reactive diluent of a monomer mixture comprising in the range of from 5 weight percent to 45 weight percent of at least one active hydrogen containing monomer, said weight percentages being based on the total weight of polymeric component solids and said polymer having a GPC weight average molecular weight varying in the range of from 3,000 to 12,000; and

an isocyanate crosslinking component wherein the ratio of active hydrogen reactive groups on said isocyanate crosslinking component to active hydrogen groups on said polymeric component varies in the range of from 1.0 to 1.4.

6,015,872

SUBSTRATE FOR PRINTED CIRCUIT BOARD

Yoshihiro Kawakita, Neyagawa; Masanaru Hasegawa, Yawata; Kazunori Sakamoto, and Hideo Hatanaka, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

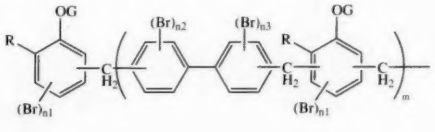
Filed May 20, 1998, Appl. No. 81,815

Claims priority, application Japan, May 22, 1997, 9-132100

Int. Cl.[7] **B32B** *7/12*

U.S. Cl. 528—102 **9 Claims**

1. A substrate for printed circuit board including an insulating material said material comprising a thermosetting resin composition comprising an epoxy resin main component and a curing agent, said epoxy resin main component including a brominated phenol novolac epoxy resin having a biphenyl skeleton as given by the formula:



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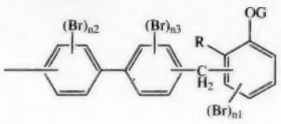


G: glycidyl radical
R: CH_3, H
m=0–4
n1=0–2
n2=0–2
n3=0–2
n1+n2+n3=2–6.

6,015,873

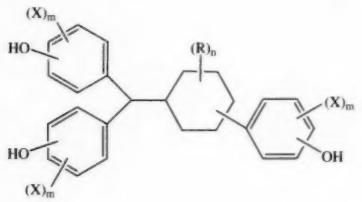
POLYPHENOL COMPOSITION AND METHOD OF PRODUCING THE SAME

Mareki Miura, and Yoshinobu Ohnuma, both of Yokkaichi, Japan, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 26, 1997, Appl. No. 883,505
Claims priority, application Japan, Jun. 26, 1996, 8-165872
Int. Cl.[7] C08G *8/04*
U.S. Cl. 528—157 **4 Claims**

1. A polyphenol composition comprising a trisphenol represented by the following formula (I):

(I)



wherein R is a methyl group, X independently is an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms or a halogen atom, and m and n are an integer of 0 to 2 and 90 to 10% by weight, based on the polyphenol composition, of an oligomer of the trisphenol.

6,015,874

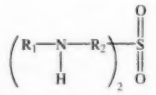
CROSSLINKABLE COMPOUND AND AN OPTICAL MATERIAL EMPLOYING IT

Haruyuki Hiratani, Kasugai, Japan, assignor to Menicon Co., Ltd., Nagoya, Japan

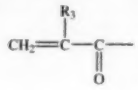
Filed Oct. 26, 1998, Appl. No. 178,427
Claims priority, application Japan, Oct. 29, 1997, 9-297268
Int. Cl.[7] C08G *75/20*
U.S. Cl. 528—391 **6 Claims**

1. A crosslinkable compound of the formula (I):

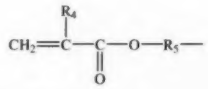
(I)



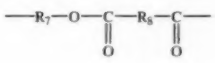
wherein R_1 is a group of the formula:



wherein R_3 is a hydrogen atom or a methyl group; a group of the formula:

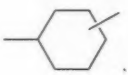


wherein R_4 is a hydrogen atom or a methyl group, and R_5 is a direct bond, a group of the formula:

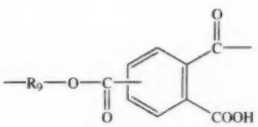


wherein R_7 is a C_{1-5} alkylene group, and R_8 is —CH_2—CH_2—, —CH=CH—, a group of the formula:

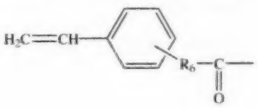
or a group of the formula:



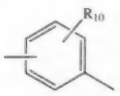
or a group of the formula:



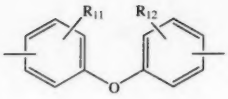
wherein R_9 is a C_{1-5} alkylene group; or a group of the formula:



wherein R_6 is a C_{1-3} alkylene group; and R_2 is a group of the formula:



wherein R_{10} is a methyl group, a methoxy group, a chlorine atom or a hydroxyl group; or a group of the formula:



wherein each of R_{11} and R_{12} which are independent of each other, is a hydrogen atom, a methyl group, a methoxy group, a chlorine atom or a hydroxyl group.

6,015,875

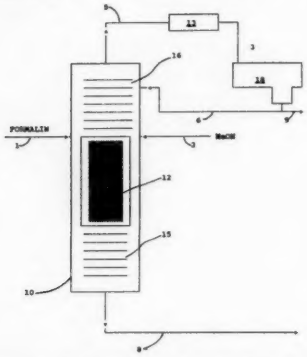
PROCESS FOR MAKING ACETALS

Lawrence A. Smith, Jr., Pasadena, and Robert P. Arganbright, Seabrook, both of Tex., assignors to Catalytic Distillation Technologies, Pasadena, Tex.

Filed Aug. 11, 1998, Appl. No. 132,174

Int. Cl.[7] **C08F** *6/10;* **C08G** *4/00*

U.S. Cl. 528—501 **19 Claims**



1. A process for the production of acetals from the reaction of aldehydes and alcohol comprising:

(a) feeding a first stream containing a linear alcohol to a distillation column reactor;

(b) feeding a second stream containing an aldehyde to the distillation column reactor;

(c) concurrently in said distillation column reactor

(i) contacting the aldehyde and alcohol in the presence of an acidic catalyst in a distillation reaction zone to react a portion of the aldehyde with a portion of the alcohol to form a reaction mixture containing acetal, water and unreacted alcohol and unreacted aldehyde,

(ii) operating said distillation column reactor to maintain the alcohol and aldehyde within said distillation reaction zone, and

(iii) separating the acetal product from the reaction mixture; and

(d) withdrawing the separated acetal from the distillation column reactor at a point above said distillation reaction zone.

6,015,876

METHOD OF USING CYANOVIRINS

Michael R. Boyd, Ijamsville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of application No. 08/429,965, Apr. 27, 1995. This application Nov. 13, 1997, Appl. No. 969,378.

Int. Cl.[7] **C07K** *14/00*

U.S. Cl. 530—300 **19 Claims**

1. A method of treating an inanimate object with an antiviral agent, which method comprises contacting said inanimate object with an antiviral effective amount of an isolated and purified antiviral agent selected from the group consisting of an antiviral protein, an antiviral peptide, an antiviral protein conjugate, and an antiviral peptide conjugate, wherein said protein or peptide is encoded by an isolated and purified nucleic acid molecule encoding at least nine contiguous amino acids of SEQ ID NO:2, wherein said at least nine contiguous amino acids of SEQ ID NO:2 has antiviral activity.

6,015,877

COMPOUNDS FOR INHIBITION OF PROTEOLYSIS

Robert R. Rando, Newton Centre, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of application No. 08/362,605, filed as application No. PCT/US93/06593, Jul. 14, 1993, Pat. No. 5,789,541, which is a continuation-in-part of application No. 07/914,164, Jul. 14, 1992, abandoned. This application Mar. 14, 1996, Appl. No. 616,995.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *38/00;38/04*

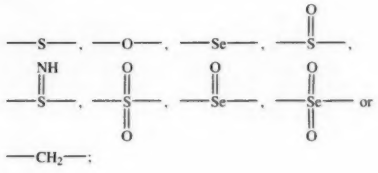
U.S. Cl. 530—326 **13 Claims**

1. A compound of the formula:

wherein

W is selected from the group consisting of: a) a farnesyl group, b) a geranylgeranyl group, c) a substituted farnesyl group, d) a substituted geranylgeranyl group, and e) a lipophilic alkyl, alkenyl, aryl or arylalkyl hydrocarbon group having between 10 and 20 carbon atoms;

Y is:



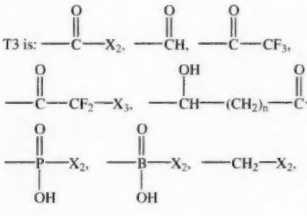
Q is

wherein

T_1 is: H, F, CH_3, or $—(CH_2)_n—X_1$;

T_2 is: —N-benzyloxycarbonyl (Boc), —N—ϕ

wherein X_1 is: —SH, —COOH, or $—CONH_2$; and n is an integer less than 20; and ϕ is an amino acid or polypeptide residue;



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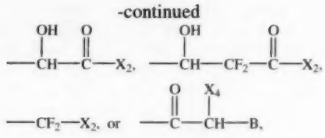


where X_4 is a halogen or —H, and B is an amino acid; and

wherein X_2 is a peptide of 20 or fewer amino acids linked to carbon via the amino terminal nitrogen of said peptide; X_3 is a peptide of 20 or fewer amino acids linked via an alpha carbon of said peptide; and n is an integer less than 20, said compound being characterized by inhibiting enzymatic proteolysis of acetyl-S-farnesyl-L-cysteinyl-L-valyl-L-isoleucyl-L-methionine producing N-acetyl-S-farnesyl-L-cysteine by an endoprotease activity, said endoprotease activity being present in a solubilized membrane-bound bovine liver microsomal membrane preparation which has been purified by ion exchange.

6,015,878

ANTITUMOR AGENTS ISOLATED FROM INTESTINAL MUCOSA, A METHOD FOR THEIR ISOLATION AND THEIR APPLICATION

Borislav Borisov Trifonov, Plovdiv; Jeorge Konstantinov Rousev, Sofia, and Nikola Atanassov Boshev, Polvdiv, all of Bulgaria, assignors to Alexandrov, Christo Alexandrov, Plovdiv, Bulgaria

PCT No. PCT/BG96/00003, § 371 Date Oct. 2, 1997, § 102(e) Date Oct. 2, 1997, PCT Pub. No. WO97/15590, PCT Pub. Date May 1, 1997

PCT Filed Mar. 4, 1996, Appl. No. 849,821

Claims priority, application Bulgaria, Oct. 20, 1995, 1000075

Int. Cl.[7] A61K *38/00;* **C07K** *7/00*

U.S. Cl. 530—329 **2 Claims**

1. A method for obtaining a compound having antitumor activity from pig intestinal mucosa comprising:

fractionating waste intestinal mass;

extracting with acetic acid;

precipitating with ethyl alcohol;

ultrafiltration in the range of about 1 to about 6 kDa; and

lyophilization of the ultrafiltrate,

the method effective for isolating the antitumor compound which is an inhibitory enterocytogenin-2 (IEG_2) peptide having an amino acid sequence of SEQ. ID. NO.:1 bound to one guanine residue.

6,015,879

PEPTIDE AND PEPTIDE ANALOG PROTEASE INHIBITORS

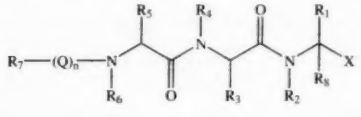
Ian Alexander McDonald; Elisabeth Albrecht, and Benito Munoz, all of San Diego, Calif., assignors to Sibia Neurosciences, Inc., La Jolla, Calif.

Continuation of application No. 08/369,422, Jan. 6, 1995, Pat. No. 5,804,560. This application May 17, 1995, Appl. No. 442,662.

Int. Cl.[7] A61K *38/06*

U.S. Cl. 530—331 **23 Claims**

1. A compound of the formula:



or a hydrate, isostere, stereoisomer or mixture thereof, or a pharmaceutically acceptable salt thereof, with the proviso that: (1) at least one of R_1, R_3 and R_5 is not a side chain of a naturally-occurring amino acid; (2) when X is an aldehyde, the side chain of the non-naturally occurring amino acid is other than the side chain of norleucine or norvaline; and (3) at least one of R_1, R_3 and R_5 is $C_{2\text{-}10}$ alkenyl or $C_{2\text{-}6}$ alkynyl; wherein:

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, X, Q and n are selected from among (i), (ii), (iii), (iv), (v), (vi) or (vii) as follows:

(i) R_1, R_3, and R_5 are each independently selected from the group consisting of a side chain of a naturally occurring α-amino acid, H, alkyl, alkenyl, alkynyl, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, Y-substituted aryl, aralkyl, aralkenyl, aralkynyl, and Z-substituted heteroaryl, heteroaralkyl, heteroaralkenyl, in which Y is selected from the group consisting of halogen, lower alkyl, alkoxy, OH, haloalkyl, nitrile, S-alkyl, phenyl, and —NRR, R is H, alkyl, lower alkyl, OH or halo-lower alkyl, Z is lower alkyl or halo lower alkyl;

R_2, R_4, R_6, and R_8 are each independently selected from H and lower alkyl;

R_7 is selected from the group consisting of C_{16} alkyl, aryl, alkenyl, 9-fluorenyl, aralkyl, aralkenyl and aralkynyl in which the aryl groups are unsubstituted or are substituted with Z;

Q is selected from the group consisting of —C(O)—, —O—C(O), —$S(O)_2$— and HN—C(O)—;

n is zero or one;

X is selected from the group consisting of —$(CH_2)_rC(O)H$, —$(CH_2)_rC(O)$haloalkyl, —$(CH_2)_rC(O)(CH_2)_rCHN_2$, —$(CH_2)_rC{\equiv}N$, —$(CH_2)_rC(O)(CH_2)_rC(O)ORD$, —$(CH_2)_rC(O)(CH_2)_rC(O)NR_DR_D$, —$(CH_2)_rC(O)W$ and —$(CH_2)_rC(O)CH_2W$, in which: R_D is selected from H, alkyl, phenyl, benzyl, and phenethyl; W is —OR_D, —SR_D, —NR_DR_D or a heterocyclic moiety, with the proviso that when X is —$(CH_2)_rC(O)W$, then W is not —OR_D; and r is 0–5; or

(ii) R_1, R_2, R_3, R_4, R_5, R_8, Y and X are selected as in (i), (iv) or (v);

n is zero; and

R_6 and R_7 are each independently selected as follows:

(a) from lower alkyl or lower alkyl bearing a heteroatom that is substituted with one of the following groups: lower alkyl, alkoxy, hydroxyl, haloalkyl, nitrile and phenyl, with the proviso that there is at least one carbon atom between the N to which R_6 and R_7 are each attached and the heteroatom, and

(b) R_6 and R_7 are unsubstituted or substituted with one or more substituents selected from Y, and

(c) together with the atoms to which each is attached form a heterocyclic moiety or a bicyclic or cyclic moiety containing from 3 to about 1 2 members; or

(iii) R_1, R_2, R_3, R_4, R_5, R_8, Y and X are selected as in (i);

Q is C(O);

n is one; and

R_6 and R_7 are each independently selected from the group consisting of —C=O—Y, phenyl, phenyl substituted with Y, lower alkyl, lower alkyl substituted with Y, and lower alkyl bearing a heteroatom that is substituted with one of the following groups: lower alkyl, alkoxy, hydroxyl, haloalkyl, nitrile and phenyl: and R_6 and R_7, together with the atoms to which they are attached, form a 4–6 membered cyclic or 8–1 2 membered bicyclic moiety, with the proviso that if two or more heteroatoms are present, there is at least one carbon atom between the heteroatoms; or

(iv) R_3, R_4, R_5, R_6, R_7, Q, X, Y and n are as defined in any of (i)–(iii) or (v)–(vii),

R_8 is H; and

R_2 and R_2 are each independently selected as follows:

(a) from lower alkyl, lower alkyl bearing a heteroatom that is substituted with one of the following groups: lower alkyl, alkoxy, hydroxyl, haloalkyl, nitrile and phenyl, or a heteroatom, with the proviso when more than one heteroatom is present, there is at least one carbon atom between each heteroatom, and

(b) R_1 and R_2 are unsubstituted or substituted with Y, and
(c) together with the atoms to which they are attached form a 4–6 membered heterocyclic moiety; or

(v) R_1, R_2, R_5, R_6, R_7, R_8, X, Q, Y and n are as defined in any of (i)–(iv) or (vi)–(vii);
R_3 and R_4 are each independently selected as follows:
(a) from lower alkyl, lower alkyl bearing a heteroatom that is substituted with one of the following groups: lower alkyl, alkoxy, hydroxyl, haloalkyl, nitrile and phenyl, or a heteroatom, with the proviso when more than one heteroatom is present, there is at least one carbon atom between each heteroatom, and
(b) is unsubstituted or substituted with Y, and
(c) together with the atoms to which they are attached form a 4–6 membered heterocyclic moiety; or

(vi) R_1, R_2, R_3, R_4, R_7, R_8, Q, X, Y and n are as defined in any of (i), (iv) or (v);
R_5 and R_6 are each independently selected as follows:
(a) from lower alkyl, lower alkyl bearing a heteroatom that is substituted with one of the following groups: lower alkyl, alkoxy, hydroxyl, haloalkyl, nitrile and phenyl, or a heteroatom, with the proviso when more than one heteroatom is present, there is at least one carbon atom between each heteroatom, and
(b) R_5 and R_6 are unsubstituted or substituted with Y, and
(c) together with the atoms to which they are attached form a 4–6 membered heterocyclic moiety; or

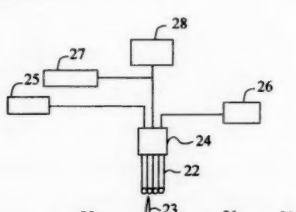
(vii) R_1, R_2, R_3, R_4, R_6, R_8, Y and X are selected as in (i) (iv) or (v);
n is zero; and
R_5 and R_7 are each independently selected as follows:
(a) from lower alkyl, lower alkyl bearing a heteroatom that is substituted with one of the following groups: lower alkyl, alkoxy, hydroxyl, haloalkyl, nitrile and phenyl, or a heteroatom, with the proviso when more than one heteroatom is present, there is at least one carbon atom between each heteroatom, and
(b) R_5 and R_7 are unsubstituted or substituted with Y, and
(c) together with the atoms to which they are attached form a 4–6 membered heterocyclic moiety; and

the compound modulates the processing of amyloid precursor protein (APP).

6,015,880
METHOD AND SUBSTRATE FOR PERFORMING MULTIPLE SEQUENTIAL REACTIONS ON A MATRIX

John D. Baldeschwieler, Pasadena; Ronald C. Gamble, Altadena, and Thomas P. Theriault, Manhattan Beach, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 16, 1994, Appl. No. 213,857
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A61K *38/00*
U.S. Cl. 530—333 **31 Claims**



1. A method of step-by-step synthesis of an array of different chemical compounds at microdrop-sized loci, where each compound is covalently attached to or beneath the surface of an undifferentiated substrate comprising the steps of:

(a) applying through a single jet of a multiple jet reagent dispenser at least one microdrop of a first reagent in liquid form to a loci on said surface, wherein said undifferentiated substrate is a porous material comprising a sheet having internal straight, essentially parallel pores, and is chemically prepared to react with said first reagent to covalently attach said reagent to said undifferentiated substrate;
(b) displacing said multiple jet reagent dispenser relative to said surface, or the surface with respect to said multiple jet reagent dispenser, and applying at least one microdrop containing either the first reagent or a second reagent from a different dispenser jet to a second loci on said surface wherein said substrate is chemically prepared to react with said reagent to covalently attach said reagent to said substrate;
(c) optionally repeating step (b) at least one time using either said first reagent, said second reagent, or different reagents in liquid form from different dispenser jets wherein each of said reagents covalently attaches to said substrate to form covalently attached compounds;
(d) washing said substrate to remove unattached reagents;
(e) modifying said attached reagents;
(f) repeating steps (a) through (e) with the same or different reagents at various loci on the substrate until the synthesis of different chemical compounds at each of at least 20 said loci is completed; and
(g) optionally removing the attached compounds at said loci from said substrate, wherein said optional removing is performed in a selective or a non-selective manner.

6,015,881
METHODS AND COMPOSITIONS FOR PEPTIDE SYNTHESIS

Myung-Chol Kang, Chapel Hill; Brian Bray, Graham; Maynard Lichty; Catherine Mader, both of Durham, and Gene Merutka, Hillsborough, all of N.C., assignors to Trimeris, Inc.

Continuation-in-part of application No. 09/045,920, Mar. 23, 1998. This application May 1, 1998, Appl. No. 71,877.
Int. Cl.[7] A61K *38/00;* **C07K** *5/00*
U.S. Cl. 530—339 **44 Claims**

1. A method for the synthesis of a peptide having the formula

Ac-YTSLIHSLIEESQNQQEKNEQEL
LELDKWASLWNWF-NH_2 (SEQ ID NO:1),

comprising:

(a) reacting a side-chain protected peptide of the formula: Fmoc-EKNEQELLEL-COOH (SEQ ID NO:11) with a side chain-protected peptide of the formula:

NH_2-DKWASLWNWF-NH_2 (SEQ ID NO:18)

to yield a side-chain protected peptide of the formula:

Fmoc-EKNEQELLELDKWASLWNWF-NH_2 (SEQ ID NO:12);

(b) deprotecting the amino terminus of the peptide produced in (a);
(c) reacting the peptide produced in (b) with a side-chain protected peptide of the formula:

Fmoc-YTSLIHSLIEESQNQQ-COOH (SEQ ID NO:4)

to yield a side-chain protected peptide of the formula:

Fmoc-YTSLIHSLIEESQNQQEKNEQEL
LELDKWASLWNWF-NH_2 (SEQ ID NO:1);

(d) modifying the amino terminus of the peptide produced in (c) into an acetyl modification; and

(e) deprotecting the side chains of the side-chain protected peptide of (d) to yield a peptide of the formula:

Ac-YTSLIHSLIEESQNQQEKNEQEL
LELDKWASLWNWF-NH_2 (SEQ ID NO:1).

6,015,882

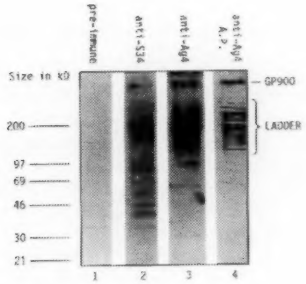
VACCINES, ANTIBODIES, PROTEINS, GLYCOPROTEINS, DNAS AND RNAS FOR PROPHYLAXIS AND TREATMENT OF *CRYPTOSPORIDIUM PARVUM* INFECTIONS

Carolyn Petersen, Berkeley; James Leech, Daly City; Richard C. Nelson, San Francisco, and Jiri Gut, Novato, all of Calif., assignors to The Regents of the University of California

Continuation-in-part of application No. 08/415,751, Apr. 3, 1995, Pat. No. 5,643,772, which is a continuation of application No. 08/071,880, Jun. 1, 1993, abandoned, which is a continuation-in-part of application No. 07/891,301, May 29, 1992, abandoned. This application Aug. 14, 1996, Appl. No. 700,651.

Int. Cl.[7] C07K *1/00*

U.S. Cl. 530—350 **17 Claims**



1. An isolated and sequenced Cryptosporidium antigen GP900 detected at the surface of Cryptosporidium sporozoites or merozoites comprising 1721 amino acid sequence SEQ ID NO: 5,

wherein said antigen has a molecular weight greater than 900 kilodaltons,

wherein said antigen is detected by anti-GP900 antibodies raised against said antigen amino acid sequence SEQ ID NO: 5, and

wherein said anti-GP900 antibodies structurally interact with the GP900 antigen and inhibit Cryptosporidium infection, invasion or adhesion.

6,015,883

RANTES HOMOLOG FROM PROSTATE

Phillip R. Hawkins; Olga Bandman, both of Mountain View, and Lynn E. Murry, Portola Valley, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Division of application No. 08/633,682, Apr. 17, 1996, Pat. No. 5,840,544. This application Sep. 24, 1997, Appl. No. 936,772.

Int. Cl.[7] C07K *14/52;* **A61K** *38/19*

U.S. Cl. 530—351 **2 Claims**

1. A purified polypeptide comprising the amino acid sequence of SEQ ID NO: 2.

6,015,884

SOLUBLE DIVALENT AND MULTIVALENT HETERODIMERIC ANALOGS OF PROTEINS

Jonathan Schneck, Silver Spring, and Sean O'Herrin, Baltimore, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Provisional application No. 60/014,367, Mar. 28, 1996. This application Mar. 28, 1997, Appl. No. 828,712.

Int. Cl.[7] C07K *16/00;* **C12P** *21/08*

U.S. Cl. 530—387.3 **10 Claims**

1. A first molecular complex which comprises at least four fusion proteins, wherein:

(a) two first fusion proteins comprise (i) an immunoglobulin heavy chain, wherein the immunoglobulin heavy chain comprises a variable region, and (ii) an extracellular domain of a first transmembrane polypeptide; and

(b) two second fusion proteins comprise (i) an immunoglobulin light chain and (ii) an extracellular domain of a second transmembrane polypeptide; wherein the fusion proteins associate to form the first molecular complex, wherein the first molecular complex comprises two ligand binding sites, each ligand binding site formed by the extracellular domains of the first and second transmembrane polypeptides, wherein the affinity of the first molecular complex for a cognate ligand is increased compared to a second molecular complex consisting of the extracellular domain of the first transmembrane polypeptide and the extracellular domain of the second transmembrane polypeptide.

6,015,885

POLYAZO COMPOUND AND METHOD FOR DYEING OR TEXTILEPRINTING FIBER MATERIAL USING THE SAME

Yoshiteru Ohta, Ibaraki, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 10, 1997, Appl. No. 889,888

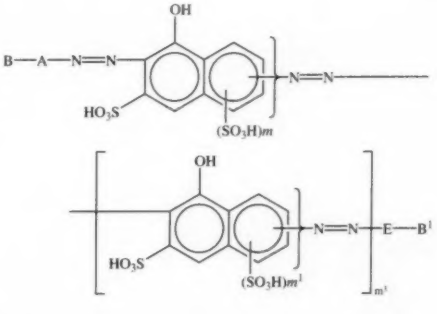
Claims priority, application Japan, Jul. 11, 1996, 8-181830; Oct. 11, 1996, 8-270168; Dec. 26, 1996, 8-348937; Jan. 21, 1997, 9-008690

Int. Cl.[7] C09B *62/09;62/513;62/03;* **D06P** *1/38*

U.S. Cl. 534—637 **11 Claims**

1. A polyazo compound represented by the following formula (I):

(I)



wherein

A represents unsubstituted phenylene, phenylene substituted with 1, 2 or 3 substituents selected from the group consisting of methyl, ethyl, methoxy, ethoxy, chloro, bromo, carboxy, nitro, acylamino having 1 to 4 carbon atoms, sulfo and a group represented by the following general formula (18) or (19):

$$—NHCOR^{18} \quad (18)$$

$$—NHSO_2R^{18} \quad (19)$$

wherein

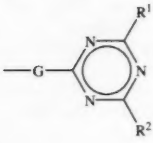
R^{18} represents optionally substituted lower alkyl, optionally substituted phenyl or optionally substituted naphthyl, unsubstituted naphthylene or naphthylene substituted with 1, 2 or 3 sulfo groups;

E represents unsubstituted hydroxynaphthylene, or hydroxynaphthylene substituted with at least one non-reactive substitutent;

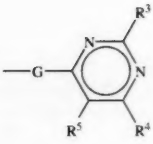
m, m^1 and m^3 independently represent an integer of 0 or 1;

B represents hydrogen atom, $—SO_2$-Z in which Z represents $—CH=CH_2$ or $—CH_2CH_2Y$ in which Y represents a group eliminatable by an action of an alkali, or a group represented by the following formula (1), (2) or (3):

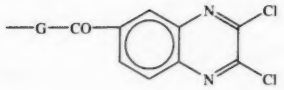
(1)



(2)



(3)

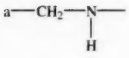


wherein

G represents a group represented by the following formula (4) or (5):

(4)

(5)

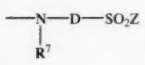


wherein

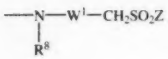
"a" represents to bond with A or E; and R represents hydrogen atom or optionally substituted lower alkyl;

R^1 represents a group represented by the following general formula (7), (8), (9) and (10):

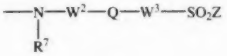
(7)



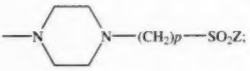
(8)



(9)



(10)



wherein

R^7 represents hydrogen atom or optionally substituted lower alkyl;

D represents optionally substituted phenylene or optionally substituted naphthylene;

Z represents the same definition as above;

W^1 represents optionally substituted straight-chain or branched lower alkylene;

R^8 represents hydrogen atom, optionally substituted lower alkyl or $—W^1—CH_2SO_2Z$ in which W^1 and Z represent the same definition as above;

W^2 and W^3 independently represent straight-chain or branched alkylene having 2 to 6 carbon atoms;

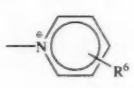
Q represents —O— or $—NR^9$ in which R^9 represents hydrogen atom or lower alkyl; and

p represents an integer of 1 to 6;

R^2, which is same as or different from R^1, represents fluorine atom; chlorine atom; optionally substituted amino; $—OR^{10}$ or $—SR^{10}$, in which R^{10} represents hydrogen atom, optionally substituted lower alkyl or optionally substituted phenyl;

a group represented by the following formula (6):

(6)



wherein

R^6 represents hydrogen atom, lower alkyl, carbamoyl or carboxyl;

or a group represented by the formula (7), (8), (9) or (10);

R^3 and R^4 independently represent fluorine atom, chlorine atom or hydrogen atom; and

R^5 represents hydrogen atom, fluorine atom, chlorine atom, cyano or lower alkyl; and

B^1, which is same as or different from B, represents hydrogen atom or a group represented by the formula (1), (2) or (3); provided that at least one of B and B^1 represents a group represented by the formula (1);

or a salt thereof.

6,015,886

OLIGONUCLEOTIDE PHOSPHATE ESTERS

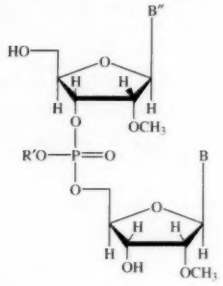
Roderic M. K. Dale, Wilsonville, Oreg.; Amy Arrow, Newtown, Conn.; Suresh C. Srivastava, Burlington, and Syed K. Raza, Waltham, both of Mass., assignors to ChemGenes Corporation, Ashland, Mass., and Oligos Etc., Inc., Wilsonville, Oreg.

Continuation-in-part of application No. 08/662,447, Jun. 10, 1996, abandoned, which is a continuation of application No. 08/065,016, May 24, 1993, Pat. No. 5,525,719. This application Feb. 5, 1997, Appl. No. 795,926.

Int. Cl.[7] **C07H** *21/00;21/02;21/04*

U.S. Cl. 536—23.1 **14 Claims**

1. A compound represented by the formula:

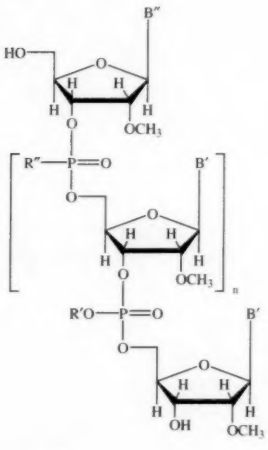


wherein O is oxygen; C is carbon, and H is hydrogen;

R' is part of an alkyl phosphate triester internucleosidyl group, and said R' is selected from the group consisting of methyl, ethyl, isopropyl, propyl and higher alkyl homologs to C-15; and

B and B" are natural and modified nucleobase radicals selected from the group consisting of 9-adeninyl, 1-thyminyl, 1-cytosinyl, 9-guaninyl, 9-hypoxanthinyl, 1-(5-methylcytosinyl), 1-(5-azacytosinyl), 1-(5-bromouracilyl), 1-(5-bromocytosinyl), 1-(5-fluorouracilyl), 1-(5-fluorocytosinyl), 1-(5-chlorocytosinyl), 1-(5-chlorouracilyl), 1-(5-iodouracilyl), 1-(5-iodocytosinyl), 1-(5-propynyluracilyl) and 1-(5-propynylcytosinyl).

2. A compound represented by the formula:



wherein n is 1–60;

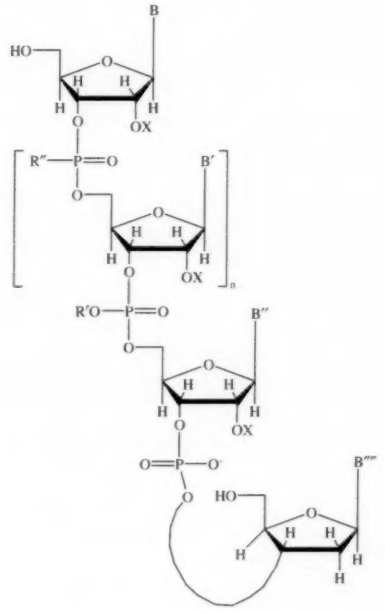
O is oxygen; C is carbon, and H is hydrogen;

R' is part of an alkyl phosphate triesters located at the terminal 3' internucleosidyl position, and said R' is selected from the group of alkyl radicals consisting of methyl, ethyl, isopropyl, propyl and higher alkyl homologs up to C-15;

R" is selected from the group consisting of OH, OCH_3, OC_2H_5, S^- and NR"R"" wherein N is nitrogen, R"' is a second alkyl radical selected from the group consisting of methyl, ethyl, propyl, isopropyl and alkyl homologs up to 16 carbons, and R"" is a third alkyl radical selected from the group consisting of methyl, ethyl, propyl, isopropyl and alkyl homologs up to 16 carbons; and

B, B' and B" are natural and modified nucleobase radicals selected from the group consisting of 9-adeninyl, 1-thyminyl, 1-cytosinyl, 9-guaninyl, 9-hypoxanthinyl, 1-(5-methylcytosinyl), 1-(5-azacytosinyl), 1-(5-fluorouracilyl), 1-(5-fluorocytosinyl), 1-(5-bromouracilyl), 1-(5-bromocytosinyl), 1-(5-chlorocytosinyl), 1-(5-chlorouracilyl), 1-(5-iodouracilyl), 1-(5-iodocytosinyl), 1-(5-propynyluracilyl) and 1-(5-propynylcytosinyl).

12. A compound represented by the formula:



wherein n is 1–60;

wherein O is oxygen; C is carbon, and H is hydrogen;

R' is part of an alkyl phosphate triester groups, and said R' is selected from the group consisting of methyl, ethyl, isopropyl, propyl and higher alkyl homologs up to C-5;

X is selected from the group consisting of methyl, ethyl, propyl, and isopropyl and higher alkyl homologs to C-5;

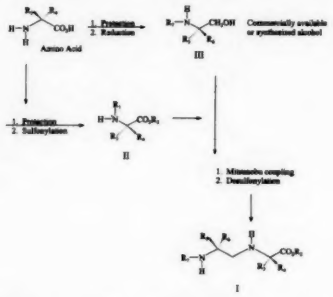
R" is selected from the group consisting of OH, OCH_3, OC_2H_5, OC_3H_7, O-iso C_3H_7, and S^-; and

B, B', B" and B"" are natural and modified nucleobase radicals selected from the group consisting of 9-adeninyl, 1-thyminyl, 1-cytosinyl, 9-guaninyl, 9-hypoxanthinyl, 1-(5-methylcytosinyl), 1-(5-azacytosinyl), 1-(5-bromouracilyl), 1-(5-bromocytosinyl), 1-(5-fluorouracilyl), 1-(5-fluorocytosinyl), 1-(5-chlorouracilyl), 1-(5-chlorocytosinyl), 1-(5-iodouracilyl), 1-(5-iodocytosinyl), 1-(5-propynyluracilyl) and 1-(5-propynylcytosinyl).

6,015,887
CHIRAL PEPTIDE NUCLEIC ACIDS AND METHODS FOR PREPARING SAME

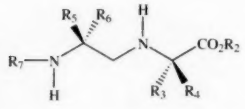
Kelly Teng, San Diego, Calif., assignor to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Filed Apr. 11, 1997, Appl. No. 843,034
Int. Cl.[7] C12Q *1/68;* **C07H** *21/02;21/04;* **A01N** *43/04*
U.S. Cl. 536—23.1 **42 Claims**



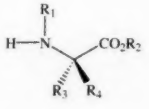
1. A method for preparing a compound of formula (I):

(I)



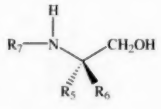
comprising the steps of providing an amine of formula (II):

(II)



and contacting said amine with an alcohol of formula (III):

(III)



for a time and under conditions sufficient to effect dehydrative coupling thereof, wherein:

R_1 is a first amine protecting group;

R_2 is a carboxyl protecting group;

one of R_3 and R_4 is H and the other of R_3 and R_4 is C_2–C_{10} alkyl or substituted alkyl, C_2–C_{10} alkenyl or substituted alkenyl, C_2–C_{10} alkynyl or substituted alkynyl, C_4–C_7 carbocylo alkyl or alkenyl, an ether having 2 to 10 carbon atoms and 1 to 4 oxygen or sulfur atoms, an amino acid side chain, a polyalkyl glycol, C_7–C_{14} aralkyl or substituted aralkyl; or a substituted or unsubstituted nitrogen, sulfur or oxygen containing heterocycle; and where said substitutions are selected from hydroxyl, alkoxy, alcohol, benzyl, phenyl, nitro, thiol, thioalkoxy, halogen, alkyl, aryl, alkenyl, alkynyl, amidinyl, keto, carbonyl, amido, carbocylic acid ester or guanidinyl;

one of R_5 and R_6 is H and the other of R_5 and R_6 is C_2–C_{10} alkyl or substituted alkyl, C_2–C_{10} alkenyl or substituted alkenyl, C_2–C_{10} alkynyl or substituted alkynyl, C_4–C_7 carbocylo alkyl or alkenyl, an ether having 2 to 10 carbon atoms and 1 to 4 oxygen or sulfur atoms, an amino acid side chain, a polyalkyl glycol, C_7–C_{14} aralkyl or substituted aralkyl; or a substituted or unsubstituted nitrogen, sulfur or oxygen containing heterocycle; and where said substitutions are selected from hydroxyl, alkoxy, alcohol, benzyl, phenyl, nitro, thiol, thioalkoxy, halogen, alkyl, aryl, alkenyl, alkynyl, amidinyl, keto, carbonyl, amido, carbocylic acid ester or guanidinyl; and

R_7 is a second amine protecting group.

6,015,888
ALLELE OF HUMAN HISTAMINE H_2 RECEPTOR AND METHODS OF DETECTION OF H_2 RECEPTOR VARIANTS

Paul Roy Heath, Sheffield; Paul Richard Orange, Preston; Ronald Carl Alan Pearson, Newcastle-upon-Tyne, and Simon Ralph Wright, Sheffield, all of United Kingdom, assignors to University of Sheffield, United Kingdom

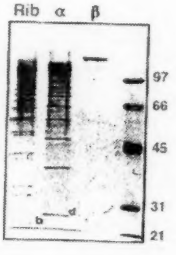
PCT No. PCT/EP96/00397, § 371 Date Jan. 5, 1998, § 102(e) Date Jan. 5, 1998, PCT Pub. No. WO96/23880, PCT Pub. Date Aug. 8, 1996
PCT Filed Jan. 30, 1996, Appl. No. 875,540
Claims priority, application United Kingdom, Jan. 30, 1995, 9503866
Int. Cl.[7] C07H *21/04;* **C12N** *15/12;15/63*
U.S. Cl. 536—23.5 **8 Claims**

1. An isolated nucleic acid comprising at least 413 contiguous nucleotides of SEQ ID NO:14, wherein the 413 contiguous nucleotides contain one or more of the mutations selected from the group consisting of T to C at nucleotide 398, A to T at nucleotide 525, A to G at nucleotide 620, A to G at nucleotide 649, A to G at nucleotide 692, and G to A at nucleotide 802, wherein the nucleotide numberings are relative to SEQ ID NO:14.

6,015,889
PROTEIN RIB, A CELL SURFACE PROTEIN THAT CONFERS IMMUNITY TO MANY STRAINS OF THE GROUP B STREPTOCOCCUS: PROCESS FOR PURIFICATION OF THE PROTEIN, REAGENT KIT AND PHARMACEUTICAL COMPOSITION

Gunnar Lindahl; Margaretha Stalhammar-Carlemalm, and Lars Stenberg, all of Lund, Sweden, assignors to Gunnar Lindahl, Lund, Sweden

Continuation-in-part of application No. 08/487,675, Jun. 7, 1995, Pat. No. 5,869,064, which is a continuation of application No. PCT/SE94/00246, Mar. 21, 1994. This application Jul. 31, 1997, Appl. No. 904,263.
Claims priority, application WIPO, Mar. 19, 1993, PCT/SE93/00234
This patent is subject to a terminal disclaimer.
Int. Cl.[7] C07H *21/04*
U.S. Cl. 536—23.5 **17 Claims**



1. A purified protein encoded by SEQ ID NO:4 or immunogenic fragment thereof which is resistant to degradation by trypsin and pepsin.

6,015,890

EMBCAB OPERON OF MYCOBACTERIA AND MUTANTS THEREOF

William R. Jacobs, Jr., City Island, N.Y.; James M. Musser, Bellaire, Tex., and Amalio Telenti, Burgistein, Switzerland, assignors to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Filed Mar. 20, 1997, Appl. No. 822,586

Int. Cl.[7] C07H *21/04;21/02;* C12Q *1/68;* C12P *19/34*

U.S. Cl. 536—23.7 10 Claims

1. A purified and isolated nucleic acid sequence of the embCAB operon from *M. tuberculosis* having the nucleotide sequence contained in FIG. **4** (SEQ ID NO:45).

6,015,891

SYNTHETIC INSECTICIDAL CRYSTAL PROTEIN GENE HAVING A MODIFIED FREQUENCY OF CODON USAGE

Michael J. Adang, Athens, Ga., and Elizabeth E. Murray, Madison, Wis., assignors to Mycogen Plant Science, Inc., San Diego, Calif.

Division of application No. 08/369,835, Jan. 6, 1995, Pat. No. 5,567,600, which is a continuation-in-part of application No. 08/057,191, May 3, 1993, Pat. No. 5,380,831, which is a continuation of application No. 07/827,844, Jan. 28, 1992, abandoned, which is a continuation of application No. 07/242,482, Sep. 9, 1988, abandoned. This application Aug. 29, 1996, Appl. No. 705,438.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12N *15/00;15/32;15/82*

U.S. Cl. 536—23.71 6 Claims

1. A synthetic *Bacillus thuringiensis* (*B.t.*) gene which is expressed in descendant plant cells and encodes a pesticidal protein toxin, wherein said synthetic *B.t.* gene is produced by the process of:

selecting a *B.t.* pesticidal protein toxin desired to be expressed in a plant cell;

obtaining a table indicating codon usage bias for a gene or genes more highly expressed in a plant cell than a native *B.t.* gene;

using said table to design a modified coding sequence which encodes said protein toxin, whereby said modified coding sequence has a frequency of codon usage that more closely resembles the frequency of codon usage of the plant cell in which it is to be expressed than did the native *B.t.* coding sequence encoding said protein toxin, said modified coding sequence having at least about 10% of the nucleotides changed as compared to the native *B.t.* coding sequence;

obtaining a synthetic *B.t.* gene comprising a coding region comprising said modified coding sequence wherein said coding region is under the control of a plant-expressible promoter;

introducing said synthetic *B.t.* gene into a plant cell;

culturing said cell to obtain descendant plant cells or plants comprising descendant plant cells, said descendant plant cells comprising said synthetic *B.t.* gene; and

establishing that said synthetic *B.t.* gene is expressed in said descendant plant cells.

6,015,892

OLIGONUCLEOTIDE MODULATION OF PROTEIN KINASE C

C. Frank Bennett, Carlsbad; Russell T. Boggs, Cardiff, and Nicholas M. Dean, Encinitas, all of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

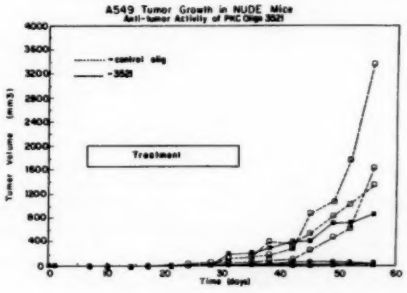
PCT No. PCT/US94/07770, § 371 Date Jan. 11, 1996, § 102(e) Date Jan. 11, 1996, PCT Pub. No. WO95/02069, PCT Pub. Date Jan. 19, 1995

Continuation of application No. 08/199,779, Feb. 22, 1994, Pat. No. 5,681,747, which is a continuation of application No. 08/089,996, Jul. 9, 1993, Pat. No. 5,703,054, which is a continuation-in-part of application No. 07/852,852, Mar. 16, 1992, abandoned. This PCT application Jul. 8, 1994, Appl. No. 578,615.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12Q *1/68;* C12N *15/85;* C07H *21/04;21/02*

U.S. Cl. 536—24.5 20 Claims



1. An oligonucleotide up to 50 nucleotide units in length comprising a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 52 and 53.

6,015,893

OLIGONUCLEOSIDE COMPOUNDS AND METHODS FOR INHIBITING TUMOR GROWTH, INVASION AND METASTASIS

William G. Cance; Edison T. Liu, and Lewis V. Owens, all of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation of application No. 08/276,843, Jul. 18, 1994, abandoned. This application May 27, 1997, Appl. No. 863,118.

Int. Cl.[7] C07H *21/00*

U.S. Cl. 536—24.5 15 Claims

1. An oligonucleoside compound comprising from about 6 to about 40 linked nucleosides in a sequence that is complementary to at least a portion of a focal adhesion kinase mRNA selected from the group consisting of 5'- . . . UUU GAU AAG GAA UCG UUC AAG UGU . . . -3' (SEQ ID NO:9); and 5'. . . CUU GGU UCA AGC UCG AUU AU . . . -3' (SEQ ID NO:10), wherein said oligonucleoside inhibits expression of human focal adhesion kinase protein.

6,015,894

OLIGONUCLEOTIDE MODULATION OF CELL ADHESION

C. Frank Bennett, Carlsbad, Calif., and Christopher K. Mirabelli, Dover, Mass., assignors to Isis Pharmaceuticals Inc., Carlsbad, Calif.

Continuation of application No. 08/440,740, May 12, 1995, Pat. No. 5,843,738, which is a continuation-in-part of application No. 08/063,167, May 17, 1993, Pat. No. 5,514,788, which is a continuation of application No. 07/969,151, Feb. 10, 1993, abandoned, which is a continuation-in-part of application No. 08/007,997, Jan. 21, 1993, Pat. No. 5,591,623, which is a continuation-in-part of application No. 07/939,855, Sep. 2, 1992, abandoned, which is a continuation-in-part of application No. 07/567,286, Aug. 14, 1990, abandoned. This application Dec. 2, 1997, Appl. No. 982,845.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C70H** *21/00*

U.S. Cl. 536—24.5 **4 Claims**

1. An antisense oligonucleotide targeted to a translation initiation site of a nucleic acid presented in FIG. **1** encoding intercellular adhesion molecule-1, said antisense oligonucleotide comprising from 8 to 25 nucleotide subunits, wherein said antisense oligonucleotide modulates the production of said intercellular adhesion molecule-1.

6,015,895

LINKER ARM FOR SOLID SUPPORT OLIGONUCLEOTIDE SYNTHESIS AND PROCESS FOR PRODUCTION THEREOF

Richard T. Pon, and Shuyuan Yu, both of Calgary, Canada, assignors to University Technologies International Inc., Canada

PCT No. PCT/CA96/00837, § 371 Date Jun. 19, 1998, § 102(e) Date Jun. 19, 1998, PCT Pub. No. WO97/23497, PCT Pub. Date Jul. 3, 1997

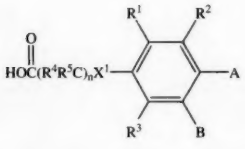
Provisional application No. 60/009,208, Dec. 22, 1995. This PCT application Dec. 13, 1996, Appl. No. 91,513.

Int. Cl.[7] **C07H** *21/00;21/02;21/04*

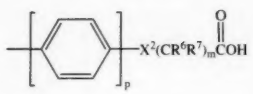
U.S. Cl. 536—25.3 **40 Claims**

1. A process for producing a chemically modified solid support for oligonucleotide synthesis, the process comprising the steps of: reacting: (A) a linker compound of Formula (I):

(I)

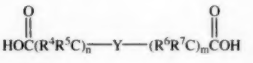


wherein: R^1, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group; R^4 and R^5 are the same or different and are selected from the group consisting of a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group; X^1 is selected from the group consisting of —O—, —S—, —$S(O)_2$— and —$N(R^{12})$—; R^{12} is selected from the group consisting of hydrogen, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group; n is 0, 1 or 2; and one of A and B is selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5– C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group, and the other of A and B has the formula:



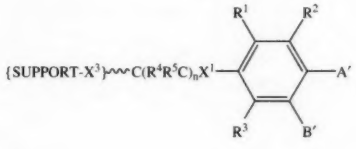
wherein p is 0 or 1, X^2 is selected from the group consisting of —O—, —S—, —$S(O)_2$—, —C(O)— and —$N(R^{13})$—, R^{13} is selected from the group consisting of hydrogen, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group, wherein R^6 and R^7 are the same or different and are selected from the group consisting of a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group, and m is 0, 1 or 2; or a compound of Formula II:

(II)



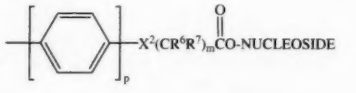
wherein Y is selected from the group consisting of —O—, —S—, —$S(O)_2$— and O—$((CH_2)_L$—O$)_q$, L is an integer less than or equal to 60, q is an integer in the range of 1–1000, and R^4, R^5, R^6, R^7, m and n have the same meaning as above, with the proviso that, when Y is O, at least one of n and m is 0 or 2; with (B) an OH of a desired nucleoside to produce a derivatized nucleoside having an ester linkage; and (C) a solid support capable of entering into an esterification reaction, to produce the linker arm.

22. A linker arm for solid support oligonucleotide synthesis, the linker arm having the following formula:



wherein:

X^1 is selected from the group consisting of —O—, —S—, —$S(O)_2$—, —C(O)— and —$N(R^{12})$—; R^{12} is selected from the group comprising hydrogen, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group; X^3 is —O— or —N(H)—; R^1, R^2, R^3, R^4 and R^5 are the same or different and are selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkylaryl group; n is 0, 1 or 2; and one of A' and B' is selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkylaryl group, and the other of A' and B' has the formula:



wherein X^2 is selected from the group consisting of —O—, —S—, —$S(O)_2$— and —$N(R^{13})$—; R^{13} is selected from the group comprising hydrogen, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group; R^6 and R^7 are the same or different and are selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl

group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkylaryl group; p is 0 or 1; and m is 0, 1 or 2.

30. A process for producing a linker arm for solid support oligonucleotide synthesis, the linker arm having the following formula:

NUCLEOSIDE-Z—X^3-{SUPPORT}

wherein X^3 is —O— or —N(H)—;

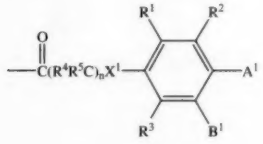
the process comprising the step of reacting together the compounds of Formulae III, IV and V:

NUCLEOSIDE-OH (III)

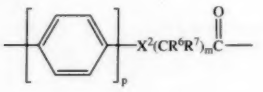
HO—Z—OH (IV)

H—X^3 ⋯⋯{SUPPORT} (V)

wherein X^3 is as defined above and Z has the following formula:



wherein: X^1 is selected from the group consisting of —O—, —S—, —$S(O)_2$—, —C(O)— and —$N(R^{12})$—; R^{12} is selected from the group comprising hydrogen, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5– C_{40} alkaryl group; X^3 is —O— or —N(H)—; R^1, R^2, R^3, R^4 and R^5 are the same or different and are selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkylaryl group; n is 0, 1 or 2; and one of A^1 and B^1 is selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkylaryl group, and the other of A^1 and B^1 has the formula:



wherein X^2 is selected from the group consisting of —O—, —S—, —$S(O)_2$— and —$N(R^{13})$—; R^{13} is selected from the group comprising hydrogen, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkaryl group, R^6 and R^7 are the same or different and are selected from the group consisting of hydrogen, halide, a substituted or unsubstituted C_1–C_{20} alkyl group, a substituted or unsubstituted C_5–C_{30} aryl group and a substituted or unsubstituted C_5–C_{40} alkylaryl group; p is 0 or 1; and m is 0, 1 or 2, said step being conducted in the presence of an activating agent selected from the group consisting of O-(7 -azabenzotriazol-1-yl)-1,3,3-tetramethyluronium hexafluorophosphate (HATU), 2-(1H-benzotriazol- 1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate, (HBTU), 1-hydroxybenzotriazole (HOBt) and mixtures thereof.

6,015,896

PHTHALOCYANINE COMPOUNDS

Prahalad Manibhai Mistry, Ashton-Under-Lyne, and Ronald Wynford Kenyon, Bridport, both of United Kingdom, assignors to Zeneca Limited, London, United Kingdom

PCT No. PCT/GB96/02297, § 371 Date Apr. 7, 1998, § 102(e) Date Apr. 7, 1998, PCT Pub. No. WO97/13811, PCT Pub. Date Apr. 17, 1997

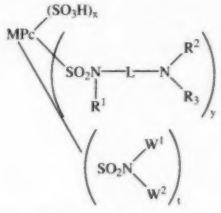
PCT Filed Sep. 20, 1996, Appl. No. 51,268

Claims priority, application United Kingdom, Oct. 7, 1995, 9520490

Int. Cl.[7] **C09D** *11/02;487/22;* **C09B** *47/04*

U.S. Cl. 540—134 **12 Claims**

1. A compound of Formula (1) and salts thereof:



in which:

M is selected from the group consisting of a metal and hydrogen;

Pc is a phthalocyanine nucleus;

R^1, R^2, W^1 and W^2 are each independently selected from the group consisting of H, optionally substituted alkyl, optionally substituted alkyl, optionally substituted aryl, and optionally substituted aralkyl;

R^3 is an aminoalkyl group of formula —$C_nH_{2n}NR^4R^5$;

Where n is from 2 to 6; and

R^4 and R^5 are selected from the group consisting of:

a. where R^4 and R^5 are independently selected from a group consisting of: H, optionally substituted alkyl, optionally substituted aryl; and optionally substituted aralkyl; and

b. where R^4 and R^5, together with the nitrogen atom to which they are attached, form a ring selected from the group consisting of pyridine, piperidine and morpholine;

L is selected from the group consisting of optionally substituted alkylene; optionally substituted aralkylene; and optionally substituted arylene;

x, y and t are each independently 0.5 to 2.5; and

(x+y+t) is from 3 to 4;

where the optional substituents are selected from the group consisting of H, C_{1-4}alkyl, C_{1-4}alkoxy, carboxy, sulpho, —OH, amino, —CN, —NO, and halo.

6,015,897

BIOTINAMIDO-N-METHYLGLYCYL-SERYL-O-SUCCINAMIDO-BENZYL DOTA

Louis J. Theodore, Lynnwood; Sudhakar Kasina, Kirkland; John M. Reno, Brier, and Linda M. Gustavson, Seattle, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Division of application No. 08/351,005, Dec. 7, 1994, abandoned, which is a continuation-in-part of application No. 08/163,188, Dec. 7, 1993, abandoned, which is a continuation-in-part of application No. PCT/US93/05406, Jun. 7, 1993, which is a continuation-in-part of application No. 07/995,381, Dec. 23, 1992, abandoned, which is a continuation-in-part of application No. 07/895,588, Jun. 9, 1992, Pat. No. 5,283,342. This application May 13, 1996, Appl. No. 645,211.

Int. Cl.[7] **C07D** *257/02*

U.S. Cl. 540—474 **1 Claim**

1. Biotinamido-N-methylglycyl-seryl-O-succinamido-benzyl DOTA.

6,015,898

PROCESSES AND COMPOSITIONS FOR NITRATION OF N-SUBSTITUTED ISOWURTZITANE COMPOUNDS WITH CONCENTRATED NITRIC ACID AT ELEVATED TEMPERATURES TO FORM HNIW AND RECOVERY OF GAMMA HNIW WITH HIGH YIELDS AND PURITIES

Raja G. Duddu, Budd Lake, and Paritosh R. Dave, Bridgewater, both of N.J., assignors to The United States of America, as represented by the Secretary of the Army, Washington, D.C.

Filed May 1, 1998, Appl. No. 71,022
Int. Cl.[7] C07D *255/04;* **C06B** *25/34*
U.S. Cl. 540—554 **26 Claims**

1.) A process for the preparation of hexanitrohexaazaisowurtzitane (HNIW) through the nitration of N-substituted,hexazaisowurtzitane (NHISW) with concentrated nitric acid by the steps of: (a) forming a solution consisting essentially of an NHISW and the concentrated nitric acid, and (b) heating the solution and maintaining the solution at a temperature of at least about 75 degrees C. for a time sufficient to produce a solid product containing HNIW.

6,015,899

LIQUID ANTIOXIDANTS AS STABILIZERS

Paul Dubs, Marly; Roger Martin, Fribourg, and Samuel Evans, Marly, all of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of application No. 08/466,520, Jun. 6, 1995, Pat. No. 5,668,206, which is a division of application No. 08/041,664, Apr. 1, 1993, Pat. No. 5,478,875. This application Apr. 21, 1997, Appl. No. 847,995.

Claims priority, application Switzerland, Apr. 8, 1992, 1153/92

Int. Cl.[7] C07D *265/30;211/20;307/94*
U.S. Cl. 544—171 **10 Claims**

1. A product obtainable by reacting components a), b) and c) in a molar ratio of a):b):c) which is 0.1:1:0.1 to 15:1:30, wherein

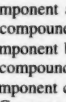
component a) is a compound of the formula I or a mixture of compounds of the formula I,

component b) is a compound of the formula II or a mixture of compounds of the formula II, and

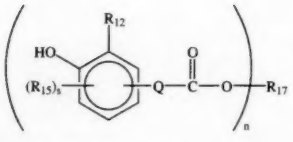
component c) is a compound of the formula III or a mixture of Compounds of the formula III,

(I)

(II)



(III)



in which, in the compound of the formula I,

the radicals Y independently of one another are $(HOCH_2CH_2)_2N$— or —HNR_1 and

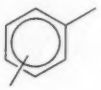
the radicals R_1 are hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, C_3–C_6alkenlyl, C_7–C_9phenylalkyl, phenyl, or phenyl which is substituted by 1 to 3 radicals A_1, the radicals A_1 independently of one another being C_1–C_{12}alkyl, halogen, hydroxyl, methoxy or ethoxy, in which

if Y is HNR_1 and a is 1,

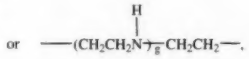
X is C_1–C_{18}alkyl, C_3–C_{18}alkenyl, C_5–C_{12}cycloalkyl, C_7–C_9phenylalkyl, phenyl, or X together with R_1 is a group of the formula $—CH_2CH_2CH_2CH_2CH_2—$ or $—CH_2CH_2OCH_2CH_2—$, or

if Y is —HNR_1 and a is 2,

X is—C_fH_{2f}—,



or



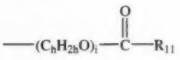
in which

f is an integer ranging from 2 to 10 and

g is an integer ranging from 1 to 6, and,

in the compound of the formula II,

the radicals Z are hydrogen or a group of the formula



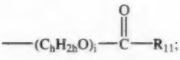
and

k is an integer ranging from 0 to 6, in which

h is 2 or 3,

i is an integer ranging from 0 to 12 and

R_{11}, is C_1–C_{30}alkyl, C_8–C_{30}alkenyl, C_5–C_{12}cycloalkyl, phenyl or C_7–C_9phenylalkyl, with the proviso that the compound of the formula II has a group



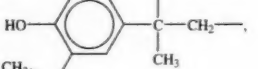
in the compound of the formula III,

R_{12} is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, phenyl or C_7–C_9phenylalkyl,

R_{15} is hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, phenyl or C_7–C_9phenylalkyl,

s is 0, 1 or 2,

Q is



in which R_{15} is as defined above,

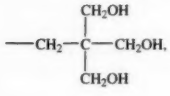
m is an integer ranging from 0 to 3,

R_{16} is C_1–C_8alkyl and

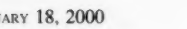
n is an integer ranging from 1 to 6, where,

if n is 1,

R_{17} is hydrogen, C_1–C_{45}alkyl, C_5–C_{12}cycloalkyl, C_2–C_{18}alkenyl, a monovalent radical of a hexose, a monovalent radical of a hexitol,



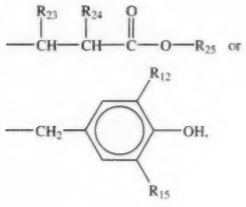
or furthermore R_{17} is $-CH_2CH_2-T_3-R_{19}$ or



in which

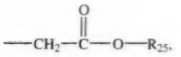
T_3 is oxygen, sulfur or

R_{19} is



in which R_{12} and R_{15} are as defined above, or

R_{19} is furthermore hydrogen, C_1–C_{24}alkyl, phenyl, C_5–C_{12}cycloalkyl or, in which



p is an integer ranging from 2 to 4,

q is an integer ranging from 2 to 20,

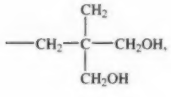
R_{22} is C_1–C_{18}alkyl, phenyl or phenyl which is substituted by 1 to 3 radicals A_1, in which the radicals A_1 independently of one another are C_1–C_{12}alkyl, halogen, hydroxyl, methoxy or ethoxy, or R_{22} is furthermore C_5–C_8cycloalkyl,

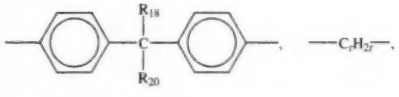
R_{23} and R_{24} independently of one another are hydrogen or methyl, with the proviso that R_{23} and R_{24} are not simultaneously methyl;

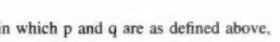
R_{25} is hydrogen or C_1–C_{24}alkyl, or,

if n is 2,

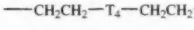
R_{17} is a divalent radical of a hexose, a divalent radical of a hexitol,

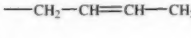






in which p and q are as defined above,





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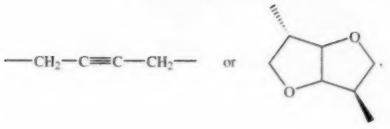
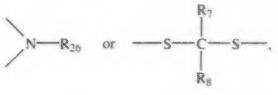


in which

R_{18} and R_{20} independently of one another are hydrogen or C_1–C_{12}alkyl or together are the radical $-CH_2CH_2CH_2CH_2CH_2-$,

r is an integer ranging from 2 to 10,

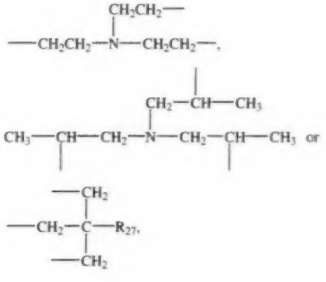
T_4 is sulfur,



in which R_7 and R_8 are as defined above, and R_{26} is hydrogen, or,

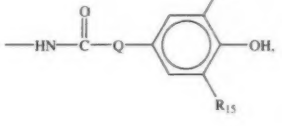
if n is 3,

R_{17} is a trivalent radical of a hexose, a trivalent radical of a hexitol,



in which

R_{27} is hydrogen, CH_2OH, C_1–C_4alkyl, C_1–C_{18}alkylamido or

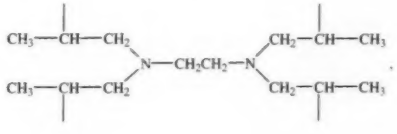


in which

Q, R_{12} and R_{15} are as defined above, or,

if n is 4,

R_{17} is a tetravalent radical of a hexose, a tetravalent radical of a hexitol, C_4–C_{10}alkanetetrayl,



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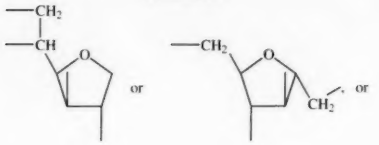
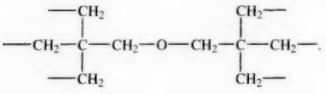


if n is 5,

R_{17} is a pentavalent radical of a hexose or a pentavalent radical of a hexitol, or,

if n is 6,

R_{17} is a hexavalent radical of a hexitol or



6,015,900

N-AMINOALKYLFLUORENECARBOXAMIDES

Jun Yuan, Guilford, and Xi Chen, Killingworth, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

PCT No. PCT/US96/14650, § 371 Date Nov. 23, 1998, § 102(e) Date Nov. 23, 1998, PCT Pub. No. WO97/10229, PCT Pub. Date Mar. 20, 1997

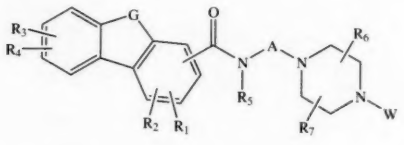
Continuation-in-part of application No. 08/527,790, Sep. 13, 1995, Pat. No. 5,659,033. This PCT application Sep. 12, 1996, Appl. No. 43,022.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C07D** *211/70;295/15*

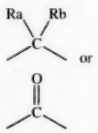
U.S. Cl. 544—380 **3 Claims**

1. A compound of the formula



or pharmaceutically acceptable salts thereof wherein:

G represents a group of the formula



where R_a and R_b independently represent hydrogen, C_1–C_6 alkyl, hydroxy, C_1–C_6 alkoxy or mono- or di-C_1–C_6 alkylamino;

A is a C_2–C_6 alkylene optionally substituted with one or more alkyl groups having from one to four carbon atoms;

R_1, R_2, R_3, R_4 are the same or different and represent hydrogen, C_1–C_6 alkyl, halogen, hydroxy, amino, cyano, nitro, trifluoromethyl, trifluoromethoxy, C_1–C_6 alkoxy, —O_2CR', —NHCOR', —COR', —SO_mR', where R' is C_1–C_6 alkyl and wherein m is 0, 1 or 2; or

R_1, R_2, R_3, R_4 independently represent —$CONR'_m$, or —NR'_m where m is 0, 1 or 2 and R' is hydrogen or C_1–C_6 alkyl;

R_5 is hydrogen or C_1–C_6 alkyl;

R_6 and R_7 are the same or different and are hydrogen or C_1–C_6 alkyl; and

W is phenyl, naphthyl, 1-(5,6,7,8-tetrahydro)naphthyl or 4-(1,2-dihydro)indenyl, pyridinyl, pyrimidyl, isoquinolinyl, benzofuranyl, benzothienyl, each of which is optionally mono-, di-, or trisubstituted with halogen, C_1–C_6 alkyl, C_1–C_4 alkoxy, C_1–C_6 thioalkoxy, hydroxy, amino, mono or dialkylamino where each alkyl is C_1–C_6 alkyl, cyano, nitro, trifluoromethyl or trifluoromethoxy.

6,015,901

S TYPE 2-SUBSTITUTED HYDROXY-2-INDOLIDINYLBUTYRIC ESTER COMPOUNDS AND PROCESS FOR PREPARATION THEREOF

Takayuki Kawaguchi, Tokyo-to; Sumihiro Nomura, Kawaguchi, and Kenji Tsujihara, Urawa, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

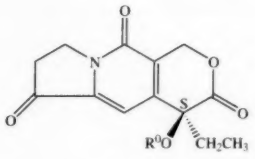
Division of application No. 08/958,979, Oct. 28, 1997, Pat. No. 5,932,732. This application Oct. 15, 1998, Appl. No. 172,666. Claims priority, application Japan, Oct. 30, 1996, 8-288074

Int. Cl.[7] **C07D** *471/14;471/22*

U.S. Cl. 546—89 **10 Claims**

1. An S type 4-substituted hydroxypyranoindolidine compound of the formula [VII]:

[VII]



wherein R^0 is a residue of a nitrogen-containing fused heterocyclic carboxylic acid having an absolute configuration of "R" which is obtained by removing hydroxy group from the carboxyl group of said carboxylic acid (in which the nitrogen atom contained in the residue is protected).

6,015,902

INTERCALATORS HAVING AFFINITY FOR DNA AND METHODS OF USE

Christopher Bieniarz, Highland Park; Jeffrey Bruce Huff, Park Ridge, and Denis R. Henrard, Lake Forest, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

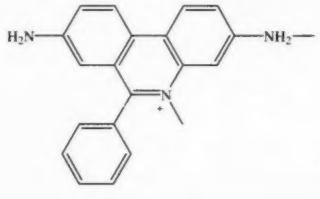
Continuation of application No. 08/265,342, Jun. 23, 1994, abandoned, which is a continuation-in-part of application No. 08/086,285, Jun. 30, 1993, abandoned. This application Oct. 21, 1996, Appl. No. 734,157.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C07D** *221/12;219/10;215/12;401/06*

U.S. Cl. 546—105 **9 Claims**

1. A compound having a formula I-T_m, m is an integer of 1 or 2, where T is 2, T is the same or different from one another, I is selected from the group consisting of:



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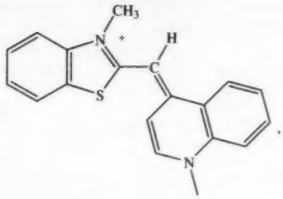

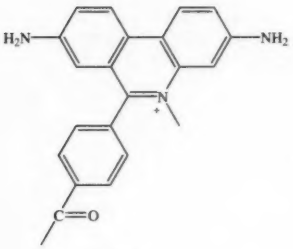

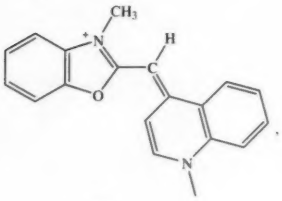

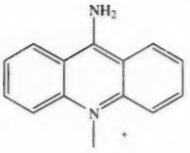

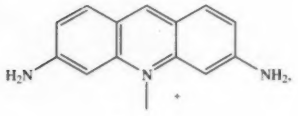

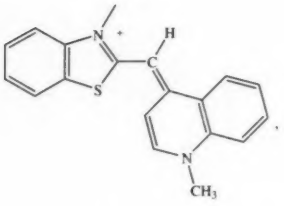

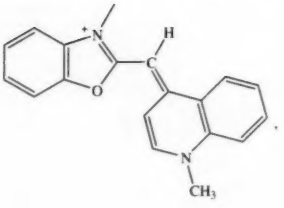

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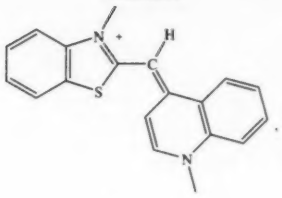
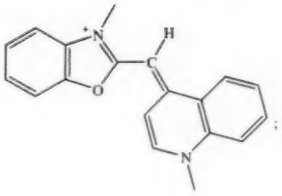
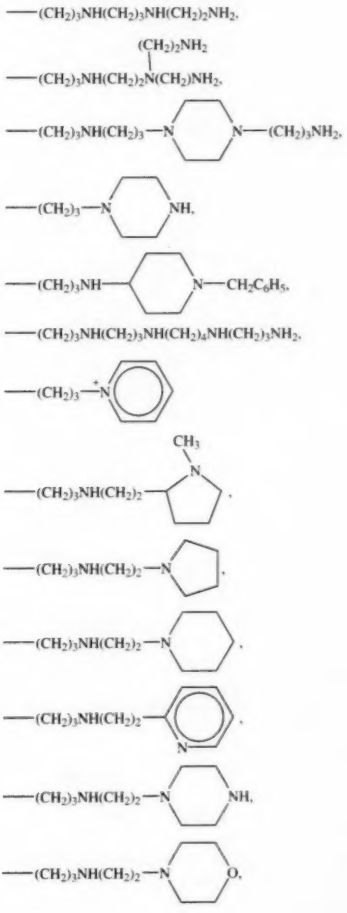




T is selected from the group consisting of:



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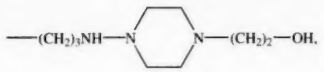
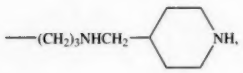
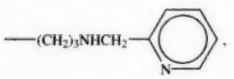
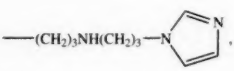
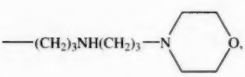


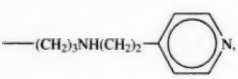




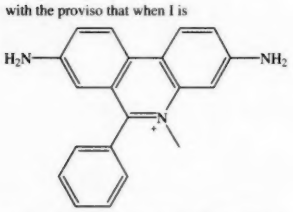
—$(CH_2)_3NHC_6H_5$,







with the proviso that when I is



T is not —$(CH_2)_2NH(CH_2)_3NH(CH_2)_2NH_2$.

6,015,903

METHOD OF RESOLVING RACEMIC MIXTURES

Wolfgang Viergutz, Ludwigshafen; Juergen Knopff, Minden, and Walter Brase, Petershagen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP96/04030, § 371 Date Feb. 26, 1998, § 102(e) Date Feb. 26, 1998, PCT Pub. No. WO97/11927, PCT Pub. Date Apr. 3, 1997

PCT Filed Sep. 13, 1996, Appl. No. 29,363

Claims priority, application Germany, Sep. 26, 1995, 195 35 762

Int. Cl.[7] C07D *217/20*

U.S. Cl. 546—147 **2 Claims**

1. A process for resolving tetrahydropapaverine by reacting tetrahydropapaverine with (+)- or (−)-2-(2,4-dichlorophenoxy)propionic acid, separating a diastereoisomer from the obtained mixture of diastereoisomers, recovering an isomeric form of tetrahydropapaverine from the separated diastereoisomer.

6,015,904

STABLE REAGENTS FOR THE PREPARATION OF RADIO PHARMACEUTICALS

Michael Sworin, 22 Appaloosa Cir., Tyngsboro, Mass. 01879; Milind Rajopadhye, 21 Honeysuckle Rd., Westford, Mass. 01886; Thomas David Harris, 56 Zion Hill Rd., Salem, N.H. 03079; David Scott Edwards, 123 Farms Dr., Burlington, Mass. 01803; Edward Hollister Cheesman, 55 Turkey Hill Rd., Lunenburg, Mass. 01462, and Shuang Liu, 17 Judith Rd., Chelmsford, Mass. 01864

Division of application No. 08/476,296, Jun. 7, 1995, Pat. No. 5,750,088, which is a continuation-in-part of application No. 08/218,861, Mar. 28, 1994, Pat. No. 5,879,657, which is a continuation-in-part of application No. 08/040,336, Mar. 30, 1993, abandoned. This application Oct. 23, 1997, Appl. No. 956,313.

Int. Cl.[7] C07D *401/00;277/60;257/00;* **A61K** *51/08*

U.S. Cl. 546—278.7 **11 Claims**

1. A stable hydrazone having the formula:

$$R^{44}(C{=}O)_s(R^{45})N{-}N{=}CR^{80}R^{81}$$

wherein:

s is 0 or 1;

R^{44} is selected from the group:

aryl substituted with 1 R^{59};

and heterocycle substituted with 1 R^{59};

R^{45} is selected from the group:

hydrogen and C_1–C_6 alkyl,

R^{59} is a chemically reactive moiety selected from the group:

alkyl substituted with halogen;

acid anhydride;

acid halide;

active ester;

isothiocyanate;

maleimide;

R^{80} and R^{81} are independently selected from the group:

H;

C_1–C_{10} alkyl;

—CN;

$—CO_2R^{85}$;

$—C(=O)R^{85}$;

$—C(=O)N(R^{85})_2$;

C_2–C_{10} 1-alkene substituted with 0–3 R^{84};

C_2–C_{10} 1-alkyne substituted with 0–3 R^{84};

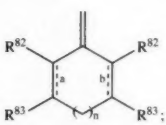
aryl substituted with 0–3 R^{84};

unsaturated heterocycle substituted with 0–3 R^{84}; and

unsaturated carbocycle substituted with 0–3 R^{84};

provided that when one of R^{80} and R^{81} is H or alkyl, then the other is not H or alkyl;

or, alternatively, R^{80} and R^{81}, may be taken together with the shown divalent carbon radical to form:



wherein:

R^{82} and R^{83} are independently selected at each occurrence from the group:

H;

R^{84};

C_1–C_{10} alkyl substituted with 0–3 R^{84};

C_2–C_{10} alkenyl substituted with 0–3 R^{84};

C_2–C_{10}alkynyl substituted with 0–3 R^{84};

aryl substituted with 0–3 R^{84};

heterocycle substituted with 0–3 R^{84}; and

carbocycle substituted with 0–3 R^{84};

or, alternatively,

R^{82}, R^{83} may be taken together to form a fused aromatic or heterocyclic ring; and

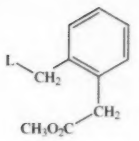
a and b indicate the positions of optional double bonds;

n is 0 or 1,

R^{84} is independently selected at each occurrence from the group: =O, F, Cl, Br, I, $—CF_3$, —CN, $—CO_2R^{85}$, $—C(=O)R^{85}$, $—C(=O)N(R^{85})_2$, $—CH_2OR^{85}$, $—OC(=O)R^{85}$, $—OC(=O)OR^{85a}$, $—OR^{85}$, $—OC(=O)N(R^{85})_2$, $—NR^{85}C(=O)R^{85}$, $—NR^{86}C(=O)OR^{85a}$, $—NR^{85}C(=O)N(R^{85})_2$, $—SO_3Na$, $—NR^{86}SO_2N(R^{85})_2$, $—NR^{86}SO_2R^{85a}$, $—SO_3H$, $—SO_2R^{85a}$, $—SR^{85}$, $—S(=O)R^{85a}$, $—SO_2N(R^{85})_2$, $—N(R^{85})_2$, $N(R^{85})_3^+$, —NHC(=NH)NHR^{85}, $—C(=NH)NHR^{85}$, $=NOR^{85}$, $—C(=O)NHOR^{85}$, $—OCH_2CO_2H$, 2-(1-morpholino)ethoxy;

R^{85}, R^{85a}, and R^{86} are independently selected at each occurrence from the group: hydrogen, C_1–C_6 alkyl.

(III)



wherein L is a leaving group.

6,015,905

PROCESS FOR THE PREPARATION OF 2-(6-SUBSTITUTED PYRID-2-YLOXYMETHYL) PHENYLACETATE

David John Ritchie, Falkirk; Gordon Richard Munns, Earley; Julie Forrester, Larbet; Michael Charles Henry Standen, Clackmannan; Paul Anthony Worthington, Maidenhead, and Raymond Vincent Heavon Jones, Linlithgow, all of United Kingdom, assignors to Zeneca Limited

PCT No. PCT/GB96/01311, § 371 Date Dec. 2, 1997, § 102(e) Date Dec. 2, 1997, PCT Pub. No. WO97/01538, PCT Pub. Date Jan. 16, 1997

PCT Filed Jun. 3, 1996, Appl. No. 973,252

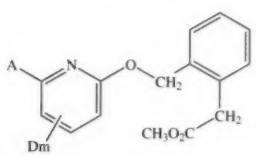
Claims priority, application United Kingdom, Jun. 28, 1995, 9513113; Jan. 31, 1996, 9601875

Int. Cl.[7] C07D *213/64;213/69;213/70;213/84*

U.S. Cl. 546—288 **8 Claims**

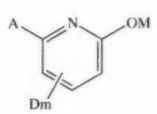
1. A process for the preparation of a compound of formula (I):

(I)



wherein A and D are independently selected from the group comprising halo, hydroxy, halo(C_{1-4})alkyl, C_{1-4} alkoxy, thio(C_{1-4})alkoxy, halo(C_{1-4}) alkoxy, phenyl, phenoxy, nitro, amino, acylamino, cyano, carboxy, C_{1-4} alkoxycarbonyl and C_{1-4} alkylcarbonyloxy, or D is C_{1-4} alkyl, and m is 0 or an integer of from 1 to 3, which comprises treating a compound of formula (II):

(II)



wherein A, D and m are as defined above and M is a metal atom, with a compound of formula (III):

6,015,906

DIMETHYLAMINE BENZOATE OR P-ANISATE CATALYSED PROCESS FOR THE PREPARATION OF 4-(NITROPHENYL)-DIHYDROPYRIDINES

Bruno Perego, and Elso Manghisi, both of Lomagna, Italy, assignors to Lusochimica S.p.A., Lomagna, Italy

PCT No. PCT/EP96/01090, § 371 Date Aug. 18, 1997, § 102(e) Date Aug. 18, 1997, PCT Pub. No. WO96/29310, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 14, 1996, Appl. No. 894,389

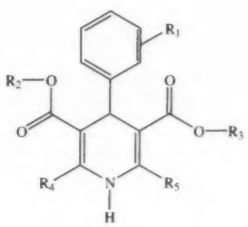
Claims priority, application Italy, Mar. 20, 1995, MI95A0540

Int. Cl.[7] C07D *211/86*

U.S. Cl. 546—321 **2 Claims**

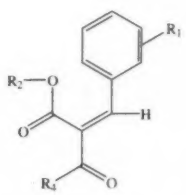
1. A process for the preparation of asymmetric esters of 4-(nitrophenyl)dihydropyridines of general formula (I)

(I)



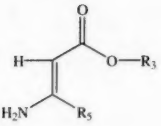
wherein R_1 is a nitro group at the 2 or 3 position; R_2 and R_3, which are different from each other, are a methyl, ethyl, isopropyl, 2-methoxyethyl or isobutyl group; R_4 and R_5 are methyl groups, by reacting a benzylidene derivative of general formula (II)

(II)



wherein R_1, R_2 and R_4 have the meanings defined above, with an enamine derivative of general formula (III)

(III)



wherein R_3 and R_5 have the meanings defined above, chacterized in that said reaction is carried out in the presence of dimethylamine benzoate or p-anisate as the catalyst, said catalyst being present in an amount of 0.005–0.015 mole per mole of benzylidene derivative.

6,015,907

TRISUBSTITUTED PYRIDINE DYES

John L. Marshall, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application No. 08/944,284, Oct. 6, 1997, Pat. No. 5,914,213, which is a continuation-in-part of application No. 08/757,195, Nov. 27, 1996, and application No. 08/858,659, May 19, 1997. This application Nov. 26, 1997, Appl. No. 979,375.

Int. Cl.[7] C07D *213/02*

U.S. Cl. 546—329 **8 Claims**

1. A 2,4,6-trisubstituted pyridine wherein at least one of the substituents is a para-(N,N-diphenylamino)phenyl group, the other two substiuenis being alkyl, cycloalkyl or phenyl groups, which alkyl, cycloalkyl or phenyl groups may be substituted or unsubstituted.

6,015,908

IL-8 RECEPTOR ANTAGONISTS

Katherine L. Widdowson, King of Prussia; Hong Nie, Conshohocken, both of Pa., and Melvin Clarence Rutledge, Jr., Thousand Oaks, Calif., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

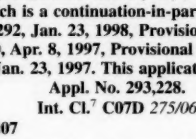
Division of application No. 09/121,264, Jul. 23, 1998, Pat. No. 5,929,250, which is a continuation-in-part of application No. PCT/US98/01292, Jan. 23, 1998, Provisional application No. 60/042,830, Apr. 8, 1997, Provisional application No. 60/035,990, Jan. 23, 1997. This application Apr. 16, 1999, Appl. No. 293,228.

Int. Cl.[7] C07D *275/06*

U.S. Cl. 548—207 **4 Claims**

1. A process for producing a compound of Formula (I),

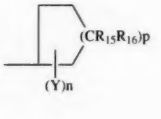
(I)



wherein

R is —NH—C(X_2)—NH—($CR_{13}R_{14}$)$_v$—Z;

Z is W, HET,



optionally substituted C_{1-10} alkyl, optionally substituted C_{2-10} alkenyl, or optionally substituted C_{2-10} alkynyl;

X is S(O)$_{m'}$;

X_2 is =O, or =S;

A is CH_2;

R_1 is independently selected from hydrogen, halogen, nitro, cyano, halosubstituted C_{1-10} alkyl, C_{1-10} alkyl, C_{2-10} alkenyl, C_{1-10} alkoxy, halosubstituted C_{1-10} alkoxy, azide, $(CR_8R_8)_q$ $S(O)_tR_4$, hydroxy, hydroxyC_{1-10} alkyl, aryl, arylC_{1-4} alkyl, aryloxy, aryl C_{1-4} alkyloxy, heteroaryl, heteroaryl C_{1-4} alkyl, heterocyclic, heterocyclic, C_{1-4} alkyl, heteroaryl C_{1-4} alkyloxy, aryl C_{2-10} alkenyl, heteroaryl C_{2-10} alkenyl, heterocyclic C_{2-10} alkenyl, $(CR_8R_8)_qNR_4R_5$, C_{2-10} alkenyl $C(O)NR_4R_5$, $C(O)NR_4R_5$, $(CR_8R_8)_qC(O)NR_4R_{10}$, $S(O)_3R_8$, $(CR_8R_8)_qC(O)R_{11}$, C_{2-10} alkenyl $C(O)R_{11}$, C_{2-10} alkenyl $C(O)OR_{11}$, $C(O)R_{11}$, $(CR_8R_8)_qC(O)OR_{12}$, $(CR_8R_8)_qOC(O)R_{11}$, $(CR_8R_8)_q$ $NR_4C(O)OR_{11}$, $(CR_8R_8)_qC(NR_4)RN_4R_5$, $(CR_8R_8)_qNR_4C(NR_5R_{11}$, $(CR_8R_8)_qNHS(O)_2R_{17}$, or $(CR_8R_8)_qS(O)_2NR_4R_5$, or two R_1 moieties together may form O—(CH_2)$_s$—O— or a 5 to 6 membered saturated or unsaturated ring; and wherein the aryl, heteroaryl and heterocyclic containing rings ma all be optionally substituted;

n is an integer having a value of 1 to 3;

m is an integer having a value of 1 to 3;

m' is an integer having a value of 2;

q is 0, or an integer having a value of 1 to 10;

s is an integer having a value of 1 to 3;

t is 0, or an integer having a value of 1 or 2;

v is 0, or an integer having a value of 1 to 4;

p is an integer having a value of 1 to 3;

HET is an optionally substituted heteroaryl;

R_4 and R_5 are independently hydrogen, optionally substituted C_{1-4} alkyl, optionally substituted aryl, optionally substituted aryl C_{1-4} alkyl, optionally substituted heteroaryl, optionally substituted heteroaryl C_{1-4} alkyl, heterocyclic, or heterocyclic C_{1-4} alkyl, or R_4 and R_5 together with the nitrogen to which they are attached form a 5 to 7 member ring which may optionally comprise an additional heteroatom selected from O/N/S;

Y is independently selected from hydrogen, halogen, nitro, cyano, halosubstituted C_{1-10} alkyl, C_{1-10} alkyl, C_{2-10} alkenyl, C_{1-10} alkoxy, halosubstituted C_{1-10} alkoxy, azide, $(CR_8R_8)_qS(O)_tR_4$, hydroxy, hydroxyC_{1-10} alkyl, aryl, aryl C_{1-4} alkyl, aryloxy, arylC_{1-4} alkyloxy, heteroaryl, heteroaryl C_{1-4} alkyl, aryl C_{2-10} alkenyl, C_{1-4} alkyloxy, heterocyclic, heterocyclic C_{1-4} alkyl, aryl C_{2-10} alkenyl, heteroaryl C_{2-10} alkenyl, heterocyclic C_{2-10} alkenyl, $(CR_8R_8)_qNR_4R_5$, C_{2-10} alkenyl $C(O)NR_4R_5$, $(CR_8R_8)_qC(O)NR_4R_5$, $(CR_8R_8)_qC(O)NR_4$ R_5, $(CR_8R_8)_qC(O)NR_4R_{10}$, $S(O)_3R_8$, $(CR_8R_8)_qC(O)R_{11}$, C_{2-10} alkenyl $C(O)R_{11}$, C_{2-10} alkenyl $C(O)OR_{11}$, $(CR_8R_8)_qC(O)R_{12}$, $(CR_8R_8)_qOC(O)R_{11}$, $(CR_8R_8)_1$ $NR_4C(O)R_{11}$, $(CR_8R_8)_qC(NR_4)NR_4R_5$, $(CR_8R_8)_qNR_{C(NR5}R_{11}$, $(CR_8R_8)_qNHS(O)_2R_a$, or $(CR_8R_8)_qS(O)_2NR_4R_5$, or two Y moieties together may form O—(CH_2)$_s$—O or a 5 to 6 membered saturated or unsaturated ring; and wherein the aryl, heteroaryl and heterocyclic containing rings may all be optionally substituted;

R_6 and R_7 are independently hydrogen or a C_{1-4} alkyl group, or R_6 and R_7 together with the nitrogen to which they are attached form a 5 to 7 member ring which ring may optionally contain an additional heteroatom which heteroatom is selected from oxygen, nitrogen or sulfur;

R_8 is independently hydrogen or C_{1-4} alkyl;

R_{10} is C_{1-10} alkyl $C(O)_2R_8$;

R_{11} is hydrogen, C_{1-4} alkyl, optionally substituted aryl, optionally substituted aryl C_{1-4} alkyl, optionally substituted heteroaryl, opticnally substituted heteroaryl C_{1-4}alkyl, optionally

substituted heterocyclic, or optionally substituted heterocyclicC_{1-4}alkyl;

R_{12} is hydrogen, C_{1-10} alkyl, optionally substituted aryl or optionally substituted arylalkyl;

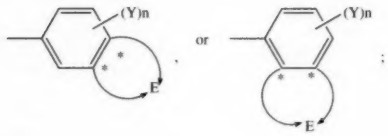
R_{13} and R_{14} are independently hydrogen, optionally substituted C_{1-4} alkyl, or one of R_{13} and R_{14} may be an optionally substituted aryl;

R_{15} and R_{16} are independently hydrogen, or an optionally substituted C_{1-4} alkyl;

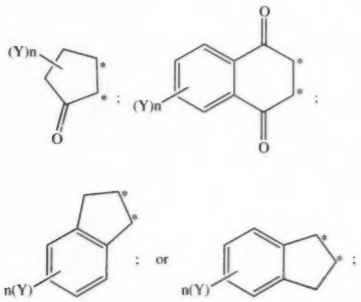
R_{17} is C_{1-4}alkyl, aryl, arylalkyl, heteroaryl, heteroarylC_{1-4}alkyl, heterocyclic, or heteorcyclicC_{1-4}alkyl, wherein the aryl, heteroaryl and heterocyclic rings may all be optionally substituted;

R_a is NR_6R_7, alkyl, arayl, C_{1-4}alkyl, arylC_{2-4}alkenyl, heteroaryl, heteroarylC_{1-4}alkyl, heteroarylC_{2-4}alkyenyl, heterocyclic, heteorcyclicC_{1-4}alkyl, and wherein the aryl, heteroaryl and heterocyclic rings may all be optionally substituted;

W is



the E containing ring is optionally selected from



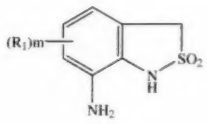
the asterix * denoting point of attachment of the ring;

or a pharmaceutically acceptable salt thereof;

which process comprises

a) reacting a compound of the formula

(A)



with a compound of the formula:

$C(X_2)$—N—$(CR_{13}R_{14})_v$—Z; wherein R_1, m, X_2, R_{13}, R_{14}, v and Z are as defined in Formula (I) to yield a compound of Formula (I).

6,015,909

ARYLIDENE COMPOUND AND SILVER HALIDE PHOTOGRAPHIC MATERIAL

Toshiki Fujiwara; Seiji Yamashita, and Keiichi Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 3, 1997, Appl. No. 922,519

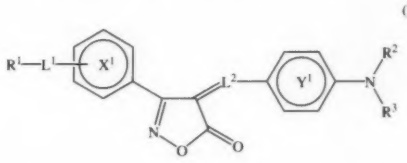
Claims priority, application Japan, Sep. 3, 1996, 8-233466; Mar. 31, 1997, 9-098080

Int. Cl.[7] **C07D** *261/12*

U.S. Cl. 548—243 **15 Claims**

1. An arylidene compound represented by the formula (I):

(I)



in which L^1 is a divalent linking group consisting of at least one —NH— and at least one of —CO— and —SO_2—; L^2 is monomethine, trimethine or pentamethine, each of which may be substituted with an alkyl group, an alkoxy group, amino, an alkylamino group, an amido group or an aryl group; R^1 is an alkyl group, an aryl group or a heterocyclic group, each of which may be substituted with a halogen atom, cyano, hydroxyl, an alkyl group, an alkoxycarbonyl group, an aryl group, a heterocyclic group, amino, an alkylamino group, an acyl group, an amido group, a sulfonamido group, a carbamoyl group or a sulfamoyl group; each of R^2 and R^3 independently is hydrogen, an alkyl group or an aryl group, the number of the total carbon atoms contained in R^2 and R^3 is not more than 20, and the alkyl group and the aryl group may be substituted with a halogen atom, cyano, hydroxyl, carboxyl, an alkyl group, an alkoxy group, an alkoxycarbonyl group, an alkylamino group, a sulfonamido group or a sulfamoyl group; the benzene ring X^1 may be further substituted with a halogen atom, cyano, hydroxyl, an alkyl group substituted with a halogen atom, an alkoxy group, an acyl group, a sulfonamido group or a sulfamoyl group; and the benzene ring Y^1 may be further substituted with an alkyl group, an alkoxy group, an aryl group, amino, an alkylamino group or an amido group.

6,015,910

INTERMEDIATES TO PESTICIDAL 5-AMINO-4-ETHYLSULFINYL-1-ARYLPRYAZOLES

Tai-Teh Wu, Chapel Hill, N.C., assignor to Rhone-Poulenc Inc., Research Triangle Park, N.C.

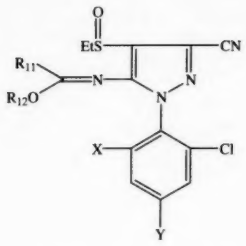
Division of application No. 09/109,409, Jul. 2, 1998, Pat. No. 5,883,112, which is a division of application No. 08/768,120, Dec. 17, 1996, Pat. No. 5,814,652, Provisional application No. 60/008,913, Dec. 20, 1995. This application Dec. 10, 1998, Appl. No. 208,581.

Int. Cl.[7] **A01N** *43/56;* **C07D** *231/44*

U.S. Cl. 548—367.7 **3 Claims**

1. A compound having the formula:

(VIII)



wherein R_{11} is hydrogen or methyl, R_{12} is alkyl, X is chlorine or bromine and Y is trifluoromethyl or trifluoromethoxy.

6,015,911

PROCESS FOR PREPARING 1-ALKYL-4-(2-CHLORO-3-ALKOXY-4-ALKYLSULFONYLBENZOYL)-5-HYDROXYPYRAZOLE AND RELATED COMPOUNDS

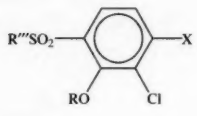
Thomas L. Siddall, Zionsville, Ind.; Mark V. M. Emonds, Midland, Mich.; Karl L. Krumel, Midland, Mich.; Jennifer M. Schomaker, Midland, Mich., and Mark W. Zettler, Carmel, Ind., assignors to Dow AgroSciences LLC, Indianapolis, Ind.

Provisional application No. 60/042,349, Mar. 24, 1997. This application Mar. 24, 1998, Appl. No. 47,173.

Int. Cl.[7] **C07D** *231/20;231/08;403/12;* **C07C** *315/00;323/00;319/00*

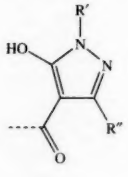
U.S. Cl. 548—369.4 **20 Claims**

1. A process for the preparation of 3-alkoxybenzene compounds of the formula:



wherein

X represents Cl, Br, CO_2H, or a 1-alkyl-5-hydroxypyrazole-4-carbonyl moiety of the formula:

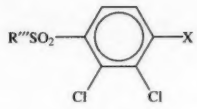


R represents a C_1–C_4 alkyl group unsubstituted or substituted with a C_1–C_4 alkoxy or C_1–C_4 alkylthio group or with a 3–6 membered alicyclic moiety having one oxygen or sulfur atom and 2–5 carbon atoms or represents a 3–6 membered alicyclic moiety having one oxygen or sulfur atom and 2–5 carbon atoms;

R" represents H or C_1–C_4 alkyl; and

R' and R'" each independently represents C_1—C_4 alkyl;

which process comprises causing a 3-chlorobenzene compound of the formula:



wherein X and R'" are as defined hereinabove

to react with an alkali metal alkoxide compound of the formula:

$RO^- M$

wherein

R is as defined hereinabove and

M^+ represents lithium, sodium, or potassium cation

in a liquid medium, optionally in the presence of a phase transfer catalyst, at a temperature of about 20° C. to about 110° C.

6,015,912

SPIROCYCLIC CONTAINING HYDROXAMIC ACIDS USEFUL AS METALLOPROTEASE INHIBITORS

Zhe Wang, Wilmington, Del.; Neil Gregory Almstead, Loveland, Ohio; Rimma Sandler Bradley, Fairfield, Ohio; Michael George Natchus, Glendale, Ohio; Biswanath De, Cincinnati, Ohio; Stanislaw Pikul, Mason, Ohio, and Yetunde Olabisi Taiwo, West Chester, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

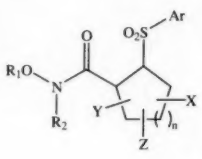
Provisional application No. 60/024,766, Aug. 28, 1996. This application Aug. 26, 1997, Appl. No. 918,328.

Int. Cl.[7] **C07D** *209/96;209/54;491/00;495/00;* **A61K** *31/40*

U.S. Cl. 548—408 **31 Claims**

1. A compound having a structure according to Formula (I)

(I)



wherein

Ar is allyl, heteroalkyl, aryl or heteroaryl, substituted or unsubstituted;

R_1 is H;

R_2 is hydrogen, alkyl or acyl;

W is nil or one or more lower alkyl groups, or is an allene, arylene or heteroarylene bridge between two adjacent or non-adjacent carbons (thus forming a fused ring);

Y is independently one or more of hydrogen, hydroxy SR_3, SOR_1, SO_2R_3, alkoxy, amino, wherein amino is of formula NR_6R_7, wherein R_6 and R_7 arc independently chosen from hydrogen, alkyl, heteroalkyl, heteroaryl aryl, OR_3, SO_2, R_8, COR_9, CSR_{10}, and $PO(R_{11})_2$; and

R_3 is hydrogen, alkyl, aryl, or heteroaryl

R_4 is alkyl, aryl, or heteroaryl;

R_8 is chosen from alkyl, aryl, heteroaryl, heteroalkyl, amino, alkylamino, dialkylamino, arylamino, diarylamino and alkylamino;

R_9 is chosen from hydrogen, alkoxy, aryloxy, heterurluxy, alkyl, aryl, heteroaryl, heteroalkyl, amino, alkylamitio, dialkylamino, arylamino and alkylarylamino;

R_{10} is chosen from alkyl, aryl, heteroaryl, heteroalkyl, amino, alkylamino, dialkylamino, arylamino, diarylamino and alkylarylamino;

R_{11} is alkyl aryl, heteroaryl, or heteroalkyl;

Z is a spiro group;

n is 1–3;

or an optical isomor, diastersomer or enantiomer for Formula (I), or a pharmaceutically-acceptable salt, or hiohydrolyzable amide, ester, or imide thereof.

6,015,913

METHOD FOR PRODUCING FAT AND/OR SOLIDS FROM COCOA BEANS

Kirk S. Kealey, Lancaster; Rodney M. Snyder, Elizabethtown, both of Pa.; Leo J. Romanczyk, Jr., Hackettstown, N.J.; John F. Hammerstone, Jr., Nazareth, Pa.; Margaret M. Buck, Morristown, N.J., and Giovanni G. Cipolla, Alpha, N.J., assignors to Mars, Incorporated, McLean, Va.

Filed Sep. 6, 1996, Appl. No. 709,406

Int. Cl.[7] **C07D** *311/78;* **A01N** *65/00;* **A23L** *1/28;* **A23G** *1/02*

U.S. Cl. 549—386 **10 Claims**

1. A method of processing cocoa beans to cocoa butter and partially defatted cocoa solids, whrerein said cocoa beans consist essentially of a shell surrounding nib, which method comprises the steps of:

(a) heating said cocoa beans for a time and at an internal bean temperature sufficient to loosen said cocoa shell without roasting said nib;

(b) winnowing said cocoa nibs from said cocoa shells;

(c) screw pressing said cocoa nibs to produce cocoa butter and partially defatted cocoa solids; and

(d) recovering said cocoa butter and said partially defatted cocoa solids, which cocoa solids contain cocoa polyphenols including cocoa procyanidins from said unroasted cocoa nibs.

6,015,914

COMPOUND HAVING OXETANYL GROUP, PROCESS FOR PRODUCING SAME, AND CURING COMPOSITION

Hiroshi Sasaki, and Akira Kuriyama, both of Aichi, Japan, assignors to Toagosei, Co., Ltd., Tokyo, Japan

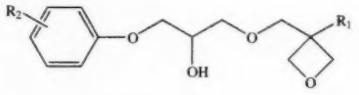
Filed Jan. 20, 1998, Appl. No. 9,053

Claims priority, application Japan, Jan. 21, 1997, 9-022053; Oct. 23, 1997, 9-309431

Int. Cl.[7] **C07D** *305/00;* **C08G** *59/68*

U.S. Cl. 549—510 **5 Claims**

1. A compound having an oxetanyl group and represented by the following formula:



wherein R_1 represents a methyl group or an ethyl group and R_2 represents a hydrogen atom, a halogen atom, a straight or branched chain alkyl group of 1–5 carbon atoms, an unsubstituted or substituted phenyl group, an unsubstituted or substituted phenoxymethyl group, an unsubstituted or substituted phenoxypropyl group or an unsubstituted or substituted phenylalkyl group.

6,015,915

PROCESS FOR DEGUMMING A FATTY SUBSTANCE AND FATTY SUBSTANCE THUS OBTAINED

Said Jamil; Jean-Pierre Ghislain Dufour, both of Brussels, and Etienne Marie Joseph Deffense, Mont-sur-Marchienne, all of Belgium, assignors to Fractionnement Tirtiaux S.A., Fleurus, Belgium

PCT No. PCT/BE94/00041, § 371 Date Feb. 26, 1996, § 102(e) Date Feb. 26, 1996

PCT Filed Jun. 16, 1994, Appl. No. 564,182

Claims priority, application Belgium, Jun. 18, 1993, 09300627

Int. Cl.[7] **C11B** *3/00*

U.S. Cl. 554—184 **21 Claims**

1. A process for degumming a fatty substance, comprising the steps of:

mixing said fatty substance with a reactive aqueous solution of a complexing agent consisting of ethylenediaminetetracetic acid or a salt thereof and optionally one member selected from the group consisting of citric acid, phosphoric acid, oxalic acid, tartaric acid, acids of the aminocarboxylic type, acids of the polyhydroxycarboxylic type, polycarboxylic acids, the salts of these acids and mixtures of two or more of these substances and an anionic, cationic, zwitterionic or nonionic type emulsifier or an emulsifier that is generated in situ by partial neutralization of free fatty acids present in the fatty substance, to extract phospholipids present in said fatty substance, said mixing being carried out by adding, all at once, the aqueous solution of complexing agent and emulsifier to the fatty substance or vice versa; and

stirring the mixture at a rate between 500 and 15000 revolutions/minute to form a fine emulsion, wherein after degumming, said fatty substance has a total content of phospholipids, expressed in the form of phosphorus, of less than 10 ppm.

6,015,916

CONSTRAINED GEOMETRY METALLOCENE CATALYST COMPLEXES

Jeffrey M. Sullivan, Loveland, and Daniel Anthony Gately, Keenesburg, both of Colo., assignors to Boulder Scientific Company, Mead, Colo.

Filed Feb. 2, 1999, Appl. No. 241,446

Int. Cl.[7] **C07F** *17/00;7/28*

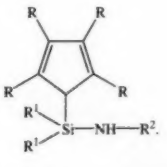
U.S. Cl. 556—7 **18 Claims**

1. A method for synthesizing a Group IV metal complex containing a tetraalkylcyclopentadiene dimethylsilyl amine ligand which comprises:

(i) reacting a tetraalkylcyclopentadiene with an alkali metal alkyl and dimethylsilyl chloride and an alkyl amine in the presence of a non-interfering medium

wherein a first reaction mixture is produced which contains a tetraalkylcyclopentadiene silyl amine of Formula I:

I



wherein R and R^2 are the same or different alkyl groups and R^1 is methyl;

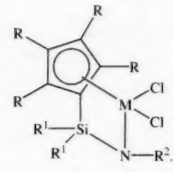
(ii) reacting said tetraalkylcyclopentadiene silyl amine produced in step (i) with an alkali metal alkyl and a MCl_4.DME complex

wherein M is a Group IV metal and DME is dimethoxyethane;

wherein said MCl_4.DME complex is slurried in a non-interfering medium; and

wherein a second reaction mixture is produced which contains a compound of Formula II:

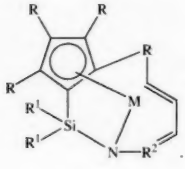
II



wherein R, R^1, R^2 and M are as defined; and

(iii) converting said Formula II compound to a compound of Formula III:

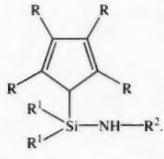
III



10. A method which comprises:

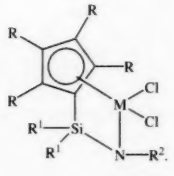
(i) reacting an alkali salt of a compound of Formula I

I



with a slurry of a $TiCl_4$.DME adduct in a non-interfering medium wherein a reaction mixture containing a compound of Formula II

II



is produced.

6,015,917

TANTALUM AMIDE PRECURSORS FOR DEPOSITION OF TANTALUM NITRIDE ON A SUBSTRATE

Gautam Bhandari, Danbury, and Thomas H. Baum, New Fairfield, both of Conn., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

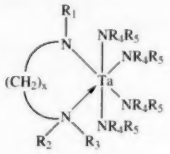
Filed Jan. 23, 1998, Appl. No. 12,679

Int. Cl.[7] **C07F** *9/00;7/28;19/00*

U.S. Cl. 556—12 **4 Claims**

1. A source reagent composition comprising at least one tantalum and/or titanium species selected from the group consisting of:

(i) tethered amine tantalum complexes of the formula:



wherein:

X is 2 or 3;

each of R_1–R_5 is independently selected from the group consisting of H, C_1–C_4 alkyl, aryl C_1–C_6 perfluoroalkyl and trimethylsilyl;

(ii) β-diimines of the formula:

$$TaG_xQ_{5-x}$$

wherein:

G is a β-diimino ligand;

each Q is selected from the group consisting of H, C_1–C_6 alkyl, aryl and C_1–C_6 perfluoroalkyl; and

x is an integer from 1 to 4 inclusive;

(iii) tantalum diamide complexes of the formula

$$Ta(N(R_1)(CH_2)_xN(R_2))_y(NR_3R_4)_{5-2y}$$

wherein:

x is 1 or 2;

y is 1 or 2;

each of R_1–R_4 is independently selected from the group consisting of H, C_1–C_4 alkyl, aryl, perfluoroalkyl, and trimethylsilyl;

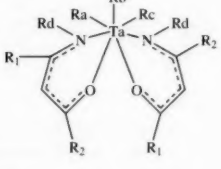
(iv) tantalum amide compounds of the formula

$$Ta(NRR')_5$$

wherein each R and R' is independently selected from the group consisting of H, C_1–C_4 alkyl, phenyl, perfluoroalkyl, and trimethylsilyl, subject to the proviso that in each NRR' group

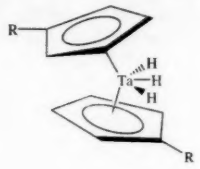
$$R \neq R';$$

(v) β-ketoimines of the formula



wherein each of R_1, R_2, R_a, R_b, R_c and R_d is independently selected from H, aryl, C_1–C_6 alkyl, and C_1–C_6 perfluoroalkyl; and

(vi) tantalum cyclopentadienyl compounds of the formula:



wherein each R is trimethylsilyl;

(vii) $Ta(NR_1R_2)_x(NR_3R_4)_{5-x}$/$Ti(NR_1R_2)_x(NR_3R_4)_{4-x}$

where each of R_1, R_2, R_3 and R_4 are independently selected form the group consisting of H, C_1–C_8 alkyl, aryl, C_1–C_8 perfluoroalkyl or a silicon-containing group selected from the group consisting of silane, alkylsilane, perfluoroalkylsilyl, triarylsilane and alkylsilylsilane, x is from 0 to 5 in the tantalum compound and x is from 1 to 4 in the titanium compound, subject to the proviso that in the titanium compound, when R_1 and R_2 are each methyl, then R_3 and R_4 are not both propyl;

(viii) $Ta(NR_1)(NR_2R_3)_3$

where each of R_1, R_2, R_3 are independently selected from the group consisting of H, C_1–C_8 alkyl aryl, C_1–C_8 perfluoroalkyl or a silicon-containing group selected from the group consisting of silane, alkylsilane, perfluoroalkylsilyl, triarylsilane and alkylsilylsilane;

(ix) $Ta(SiR_1R_2R_3)_x(NR_4R_5)_{5-x}$/$Ti(SiR_1R_2R_3)_x(NR_4R_5)_{4-x}$

where x is from 0 to 5 in the tantalum compound, x is from 1 to 4 in the titanium compound, each of $R_{1\text{-}5}$ is independently selected from the group consisting of H, Me, Et, ^{t}Bu, Ph, ^{i}Pr, CF_3, SiH_3, $SiMe_3$, $Si(CF_3)_3$, $Si(Et)_3$, $Si(^iPr)_3$, $Si(^tBu)_3$, $Si(Ph)_3$, and $Si(SiMe_3)_x(Me)_{3-x}$ where x is from 0 to 3, and subject to the proviso that in the titanium compound, when R_4 and R_5 are each methyl, then R_1, R_2, and R_3 are not all trimethylsilyl; and

(x) $(Cp^n)Ta(SiR_1R_2R_3)_x(NR_4R_5)_{4-x}$/$(Cp^n)_2Ti(SiR_1R_2R_3)(NR_4R_5)$

where x is from 0 to 4, each of $R_{1\text{-}5}$ is independently selected from the group consisting of H, Me, Et, ^{t}Bu, Ph, ^{i}Pr, CF_3, SiH_3, $SiMe_3$, $Si(CF_3)_3$, $Si(Et)_3$, $Si(^iPr)_3$, $Si(^tBu)_3$, $Si(Ph)_3$, $Si(SiMe_3)_x(Me)_{3-x}$ and Cp^n is $C_5H_xMe_{(5-x)}$ (where x=0–5).

6,015,918
ALLYL-DERIVED PRECURSOR AND SYNTHESIS METHOD

Wei-Wei Zhuang; Tue Nguyen; Greg Michael Stecker, all of Vancouver, Wash.; David Russell Evans, Beaverton, Oreg., and Sheng Teng Hsu, Camas, Wash., assignors to Sharp Laboratories of America, Inc., Camas, Wash.

Provisional application No. 60/107,892, Nov. 10, 1998. This application Mar. 30, 1999, Appl. No. 281,731.

Int. Cl.[7] **C07F** *1/08;1/10*

U.S. Cl. 556—117 **21 Claims**

1. A volatile metal (M) precursor compound for the chemical vapor deposition (CVD) of metal to selected surfaces, the precursor compound comprising:

M^{+1}(hexafluoroacetylacetonate); and

an allyl-derived ligand including a first carbon atom having a first bond to a methylene and a second bond to an H, and a second carbon double bonded to said first carbon atom, having a third bond to an H and a fourth bond to an H, and in which said methylene has a fifth bond selected from the group consisting of alkyl, phenyl, trialkoxylsilane, halodialkylsilane, dihaloalkylsilane, trihalosilane, triphenylsilane, alkoxyl, halogen, chloroformate, cynanide, cycloalkyl, cycloalkylamine, alkyl ether, isocyanate, and pentafluorobenzene, whereby a stable precursor capable of high metal deposition rates is formed.

5. A volatile metal (M) precursor compound for applying chemical vapor deposition (CVD) M to selected surfaces, the precursor compound having the following structural formula:

$(H_2C{=}CHCH_2R)M^{+1}(hfac)$

in which R is selected from the group consisting of alkyl, phenyl, trialkoxylsilane, halodialkylsilane, dihaloalkylsilane, trihalosilane, triphenylsilane, alkoxyl, halogen, chloroformate, cynanide, cycloalkyl, cycloalkylamine, alkyl ether, isocyanate, and pentafluorobenzene, whereby a precursor is formed from an allyl-derived ligand.

10. A method for synthesizing a copper(hfac) allyl-derived precursor comprising the steps of:

a) forming a uniformly mixed solution of Cu_2O in a solvent;

b) introducing an allyl-derived ligand to the solution of Step a), and forming a uniformly mixed solution;

c) introducing hexafluoroacetylacetone (hfac) to the solution of Step b), and forming a uniformly mixed solution;

d) filtering the solution to remove solid materials, whereby any excess Cu_2O is removed;

e) removing the solvent from the solution; and

f) filtering to remove the solid material, whereby a liquid phase precursor is formed.

6,015,919
DIHALOGENATED FERROCENES AND PROCESSES FOR THE PREPARATION THEREOF

Benoît Pugin, Münchenstein, Switzerland, assignor to Novartis AG, Basel, Switzerland

Division of application No. 08/930,171, Oct. 9, 1997, Pat. No. 5,925,778. This application Feb. 8, 1999, Appl. No. 246,203.

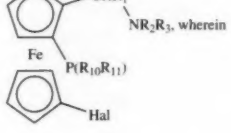
Claims priority, application Switzerland, Apr. 11, 1995, 1067/95

Int. Cl.[7] **C07F** *17/02;* **C07B** *31/00*

U.S. Cl. 556—145 **19 Claims**

1. A compound of formula III

(III)



R_1 is C_1–C_8 alkyl, phenyl or phenyl substituted by from 1 to 3 C_1–C_4 alkyl or C_1–C_4 alkoxy substituents;

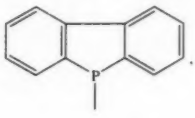
R^2 and R^3 are each independently of the other hydrogen or C_1–C_{12} alkyl; and

Hal is F, Cl, Br or I;

R_{10} and R_{11} are identical or different and are C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, phenyl, C_5–C_{12}cycloalkyl substituted by C_1–C_4alkyl or by C_1–C_4alkoxy, or phenyl substituted by from one to three C_1–C_4alkyl, C_1–C_4alkoxy, —$SiR_8R_9R_6$, halogen, —SO_3M, —CO_2M, —PO_3M, —NR_7R_8, —$(^+NR_7R_8R_9)X^-$ or C_1–C_3fluoroalkyl substituents; or

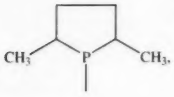
the group —$PR_{10}R_{11}$ is a radical of formula IV, IVa, IVb, or IVc

(IV)

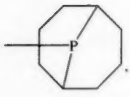


-continued

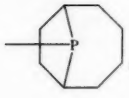
(IVa)



(IVb)



(IVc)



R_4, R_5 and R_6 are each independently of the others C_1–C_{12}alkyl or phenyl;

R_7 and R_8 are H, C_1–C_{12}alkyl or phenyl or R_7 and R_8 together are tetramethylene, pentamethylene or 3-oxa-1,5-pentylene;

R_9 is H or C_1–C_4alkyl;

M is H or an alkali metal;

X^- is the anion of a monobasic acid.

6,015,920

HYDROSILATION REACTION PROCESS WITH RECYCLE

Curtis L. Schilling, Marietta, Ohio; Patrick James Burns, Parkersburg, W. Va.; James Stephen Ritscher; Mark Paul Bowman, both of Marietta, Ohio; Thomas Edgeworth Childress, Newport, Ohio; Michael Ray Powell, New Martinsville, W. Va., and Eric Michael Graban, Marietta, Ohio, assignors to CK Witco Corporation

Filed Sep. 11, 1998, Appl. No. 151,642

Int. Cl.[7] **C07F** *7/08*

U.S. Cl. 556—479 **13 Claims**

1. A process comprising:

(a) feeding continuously a hydrosilatable olefin and a hydrosilane or hydrosiloxane capable of reacting with the olefin into a reactor;

(b) reacting said olefin with said hydrosilane or hydrosiloxane in the reactor in the presence of a catalytically effective amount of catalyst to form a hydrosilated product;

(c) withdrawing continuously from said reactor a crude product stream,

(d) separating said crude product stream in a purifier to produce

(i) a recycle stream comprising unreacted olefin, or unreacted hydrosilane or hydrosiloxane, and

(ii) a product stream comprising said hydrosilated product; and

(e) recycling said recycle stream (d)(i) into said reactor; and wherein the conversion of the stoichimetrically limiting reactant in the reactor is greater than 80%.

6,015,921

PROCESS FOR PRODUCING CARBAMOYLMETHYLUREA DERIVATIVES

Haruo Koike, Souraku-gun; Yasufumi Ueda, Tokushima; Koji Matsuda, Kobe, and Mikio Kabaki, Ashiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

PCT No. PCT/JP96/02078, § 371 Date Feb. 3, 1998, § 102(e) Date Feb. 3, 1998, PCT Pub. No. WO97/06135, PCT Pub. Date Feb. 20, 1997

PCT Filed Jul. 25, 1996, Appl. No. 147

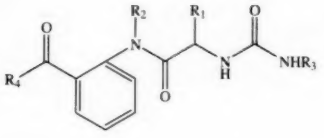
Claims priority, application Japan, Aug. 7, 1995, 7-200749

Int. Cl.[7] **C07C** *229/34;231/02*

U.S. Cl. 560—36 **5 Claims**

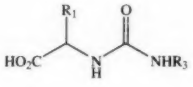
1. A method for preparing a carbamoylmethylurea derivative of the formula (I):

(I)



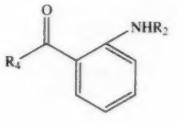
wherein R_1 is a hydrogen or lower alkyl; R_2 is a hydrogen or $—CH_2COR_5$ (R_5 is lower alkoxy, lower alkylamino, cycloalkyl, optionally substituted phenyl or optionally substituted heterocyclic group); R_3 is an optionally substituted phenyl; R_4 is an optionally substituted phenyl, optionally substituted cycloalkyl, optionally substituted alkyl or optionally substituted heterocyclic group, which comprises reacting a carboxymethylurea derivative of the formula (II):

(II)



wherein R_1 and R_3 are as defined above or a reactive derivative thereof, with an aniline derivative of the formula (III):

(III)



where R_2 and R_4 are as defined above.

6,015,922

N-ALKYL-N-ALKOXYCARBOXAMIDES AND METHODS OF USE IN PROSTAGLANDIN SYNTHESIS

Raymond E. Conrow, Crowley, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

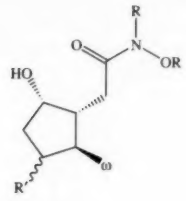
Provisional application No. 60/068,114, Dec. 19, 1997. This application Dec. 18, 1998, Appl. No. 216,564.

Int. Cl.[7] **C07C** *405/00*

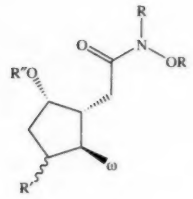
U.S. Cl. 560—312 **4 Claims**

1. A compound of either formula (IV) or (V):

(IV)



(V)



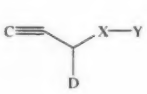
wherein,

R is C_{1-4} alkyl;

R' is hydroxy, halogen, protected hydroxy or hydrogen;

R" is a protecting group; and

ω is



wherein:

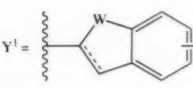
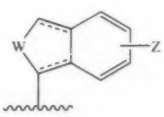
≡ is a single, double or triple bond;

D may be in the α or β configuration, and is fluorine or OR^4, wherein R^4 is H, alkyl, alkoxyalkyl, acyl, or $Si(R^6)_3$, wherein R^6 is independently C_{1-4} alkyl or phenyl;

X is $(CH_2)_m$ or $(CH_2)_mO$, wherein m is 1 to 6; and

Y is a phenyl ring optionally substituted with alkyl, halo, trihalomethyl, alkoxy, acyl, acyloxy, amino, alkylamino, acylamino, or hydroxy; or

X—Y is $(CH_2)_pY^1$; wherein p is 0 to 6; and

Y^1 =  or 

wherein:

W is CH_2, O, $S(O)_q$, NR^5, CH_2CH_2, CH=CH, CH_2O, $CH_2S(O)_q$, CH=N, or CH_2NR^5; wherein q is 0 to 2, and R^5 is H, alkyl, or acyl;

Z is H, alkyl, alkoxy, acyl, acyloxy, halo, trihalomethyl, amino, alkylamino, acylamino, or hydroxy; and

--- is an optional bond; or

X—Y is cyclohexyl.

6,015,923

PROCESS FOR THE PREPARATION OF 3-PENTENOIC ACID FROM ALLYLIC BUTENYL ALCOHOLS OR ESTERS USING A NICKEL CATALYST

Patrick Michael Burke, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., and DSM N. V., Galeen, Netherlands

Filed Dec. 17, 1998, Appl. No. 213,186

Int. Cl.[7] C07C *51/12*

U.S. Cl. 562—519 **6 Claims**

1. A process for making 3-pentenoic acid which comprises (1) reacting an allylic butenyl alcohol or allylic butenyl ester with carbon monoxide in the presence of nickel and an iodide source selected from the group consisting of HI and iodides of metals selected from the group consisting of B, Al, Ga, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Yb, Lu, Ge, Sn, Ti, Zr, Cr, Mo, W, Mn, Fe, Co, Ni and Zn at a temperature between about 60° C. and about 140° C. and a pressure between about 200 psig and about 4000 psig in a carboxylic acid solvent, and (2) recovering 3-pentenoic acid.

6,015,924

PROCESS FOR THE PREPARATION OF DIACIDS FROM THE WASHING WATERS OF CYCLOHEXANE OXIDATION PRODUCTS

Louis Le Bris, Lyons, France, assignor to R.P. Fiber & Resin Intermediates, Courbevoie, France

Filed Dec. 12, 1997, Appl. No. 989,514

Claims priority, application France, Dec. 12, 1996, 96 15524

Int. Cl.[7] C07C *51/16*

U.S. Cl. 562—524 **21 Claims**

1. A process for the preparation of aliphatic diacids from washing waters derived from a process for the oxidation of cyclohexane and containing peroxides, which comprises successively:

(a) at least partially deperoxidizing said washing waters by subjecting them to catalytic hydrogenation at a temperature of between about 0° C. and about 100° C., in the presence of at least one platinum group metal; and

(b) oxidizing with nitric acid the products obtained in the washing waters after the deperoxidation step.

6,015,925

ANTIFUNGAL AGENTS

Yukio Kawazu; Toshimitsu Suzuki; Masayuki Yuasa; Yuichi Yokomizo; Toshiro Majima; Takao Ito; Takuji Nakashima, and Akira Nozawa, all of Yokohama, Japan, assignors to Pola Chemical Industries, Inc., Shizuoka, Japan

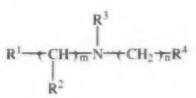
Filed Sep. 22, 1998, Appl. No. 158,093

Int. Cl.[7] C07C *211/00*

U.S. Cl. 564—316 **6 Claims**

1. A compound represented by the following formula (1):

(1)



wherein R^1 represents an unsubstituted phenyl group, an unsubstituted biphenyl group, or a phenyl or biphenyl group substituted by one or more halogen atoms, C_{1-6} alkyl groups and/or C_{1-6} alkoxy groups, R^2 represents a hydrogen atom or an unsubstituted phenyl group, an unsubstituted biphenyl group, or a phenyl or biphenyl group substituted by one or more halogen atoms, C_{1-6} alkyl groups and/or C_{1-6} alkoxy groups, R^3 represents an alkyl group having 1 to 4 carbon atoms, R^4 represents a substituted or unsubstituted phenyl group or an

aliphatic hydrocarbon group containing at least four π electrons, and m and n individually represent integers of from 1 to 4; or a salt thereof.

6,015,926

EFFICIENT ENANTIOSELECTIVE ADDITION REACTION USING AN ORGANOZINC REAGENT

Cheng Yi Chen, Colonia; Lushi Tan, Edison, and Richard D. Tillyer, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Provisional application No. 60/046,713, May 16, 1997, Provisional application No. 60/057,884, Sep. 3, 1997. This application May 11, 1998, Appl. No. 75,476.

Int. Cl.[7] C07C *211/45;* **C07D** *265/18*

U.S. Cl. 564—442 **23 Claims**

1. A process for the preparation of a compound of formula I:

I

or its enantiomer, wherein

A is:

(a) C_1–C_6-alkyl, C_2–C_6-alkenyl, or C_2–C_6-alkynyl, unsubstituted or mono- or di-substituted with a substituent selected from the group consisting of: halo, CF_3, CN, NO_2, NH_2, $NH(C_1$–C_6-alkyl), $N(C_1$–C_6-alkyl)$_2$, $CONH_2$, $CONH(C_1$–C_6-alkyl), $CON(C_1$–C_6-alkyl)$_2$, $NHCONH_2$, $NHCONH(C_1$–C_6-alkyl), $NHCON(C_1$–C_6-alkyl)$_2$, CO_2—C_1–C_6-alkyl, C_3–C_7-cycloalkyl, or C_1–C_6-alkoxy;

(b) phenyl, biphenyl, or naphthyl, unsubstituted or substituted with one to four substituents selected from R^1, R^2, R^3, and R^4;

R^1, R^2, R^3, and R^4 are independently:

halo, CF_3, CN, NO_2, NH_2, $NH(C_1$–C_6-alkyl), $N(C_1$–C_6-alkyl)$_2$, $CONH_2$, $CONH(C_1$–C_6-alkyl), $CON(C_1$–C_6-alkyl)$_2$, $NHCONH_2$, $NHCONH(C_1$–C_6-alkyl), $NHCON(C_1$–C_6-alkyl)$_2$, aryl, CO_2—C_1–C_6-alkyl, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, C_3–C_7-cycloalkyl, or C_1–C_6-alkoxy, such that C_1–C_6-alkyl is unsubstituted or substituted with aryl, aryl is defined as phenyl, biphenyl, or naphthyl, unsubstituted or substituted with C_1–C_6-alkyl, C_1–C_6-alkoxy, NO_2, or halo;

R^5 is:

(a) H,

(b) C_1–C_6-alkyl, C_2–C_6-alkenyl, or C_2–C_6-alkynyl, unsubstituted or mono- or di-substituted with a substituent selected from the group consisting of: halo, CF_3, CN, NO_2, NH_2, $NH(C_1$–C_6-alkyl), $N(C_1$–C_6-alkyl)$_2$, $CONH_2$, $CONH(C_1$–C_6-alkyl), $CON(C_1$–C_6-alkyl)$_2$, $NHCONH_2$, $NHCONH(C_1$–C_6-alkyl), $NHCON(C_1$–C_6-alkyl)$_2$, CO_2—C_1–C_6-alkyl, C_3–C_7-cycloalkyl, or C_1–C_6-alkoxy;

(c) C_1–C_4-perfluoroalkyl,

R^6 is:

C_1–C_6-alkyl, C_2–C_6-alkenyl, or C_2–C_6-alkynyl, unsubstituted or mono- or di-substituted with a substituent selected from the group consisting of: halo, CF_3, CN, NO_2, NH_2, $NH(C_1$–C_6-alkyl), $N(C_1$–C_6-alkyl)$_2$, $CONH_2$, $CONH(C_1$–C_6-alkyl), $CON(C_1$–C_6-alkyl)$_2$, $NHCONH_2$, $NHCONH(C_1$–C_6-alkyl), $NHCON(C_1$–C_6-alkyl)$_2$, CO_2—C_1–C_6-alkyl, C_3–C_7-cycloalkyl or C_1–C_6-alkoxy;

comprising the steps of:

a) adding slowly a dialkylzinc in a solvent or neat, to a first chiral additive bearing one or more exchangeable protons, or alternatively, to a mixture of a first chiral additive bearing one and only one exchangeable proton and a second additive, in a solvent under an inert atmosphere at a temperature of about −78° C. to about 50° C. to form a chiral zinc complex or a second additive containing chiral zinc complex;

b) adding a second additive to a chiral zinc complex, and heating the reaction to about 10° C. to about 70° C. to form a second additive containing chiral zinc complex, where the first chiral additive bears one and only one exchangeable proton, or alternatively, skipping this addition step where the first chiral additive bears more than one exchangeable proton, or the second additive was added in step a);

c) mixing the chiral zinc complex or the second additive containing chiral zinc complex with an organometallic reagent of formula, R^6M, where M is: Li, Na, K, Zn, MgX_1, CuX_1, or $B(X_1)_2$; and X_1 is Cl, Br, I, F, or CF_3SO_2; in a solvent at a temperature range of −20° C. to about 60° C. to form a chiral organozinc complex; and

d) mixing a carbonyl-containing compound of formula:

optionally dissolved in a solvent with the solution of the chiral organozinc complex under an inert atmosphere at a temperature of about −20° C. to about 60° C. for about 1 hour to about 72 hours.

6,015,927

PROCESS FOR PREPARING CYCLOHEXANONES BY HYDROGENATION OF THE CORRESPONDING PHENOLS (II)

Wolfgang Kiel, Odenthal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 29, 1998, Appl. No. 106,815

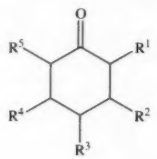
Claims priority, application Germany, Jun. 30, 1997, 197 27 710

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C07C *45/29*

U.S. Cl. 568—362 **18 Claims**

1. A process for preparing a cyclohexanone of the formula (I):

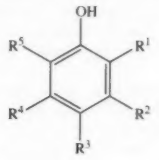


wherein R^1, R^2, R^3, R^4 and R^5 are each, independently of one another, hydrogen, hydroxyl, C_1–C_{10}-alkyl, C_3–C_6-cycloalkyl, C_6–C_{10}-aryl, C_6–C_{10}-aryl—CH_2—, C_6–C_{10}-aryl—O—, C_1–C_{10}-alkoxy, C_3–C_8-cycloalkoxy, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_1–C_4-acylamino, $COOR^6$ where R^6 is hydrogen or C_1–C_4-alkyl or R^7—CH_2— where R^7 is hydroxyl, C_1–C_4-alkoxy, C_1–C_4-alkylamino or di- C_1–C_4-alkylamino;

comprising:

prior to hydrogenating, forming a catalyst mixture of palladium-on-carbon catalyst, a base component, and from 20 to 200 % by weight of water, based on the base component to form a catalyst mixture, and

hydrogenating a phenol of the formula (II);



wherein R^1, R^2, R^3, R^4 and R^5 are defined above,

in the presence of the catalyst mixture at from 100 to 250° C. and from 1 to 20 bar of hydrogen pressure and in the presence of straight-chain, branched or cyclic alkanes having a boiling point at atmospheric pressure of over 70° C. as solvents.

6,015,928

PROCESS FOR THE PRODUCTION OF HIGHER OXO ALCOHOLS

Dietmar Gubisch, Marl; Klaus Armbrust, Duelman; Alfred Kaizik, Marl; Bernhard Scholz, Marl, and Rudolf Nehring, Marl, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Dec. 15, 1997, Appl. No. 991,005

Claims priority, application Germany, Dec. 24, 1996, 196 54 340

Int. Cl.[7] C07C *27/22;31/125*

U.S. Cl. 568—882 **18 Claims**

1. A single-stage hydroformylation process, comprising: forming a mixture comprising:

(a) an olefin;

(b) synthesis gas; and

(c) an aqueous cobalt salt solution; and in a single stage forming a cobalt catalyst; extracting into said organic phase said cobalt catalyst from said aqueous cobalt salt solution; and hydroformylating said olefin.

6,015,929

GAS HYDRATE ANTI-AGGLOMERATES

Manese Rabeony, Piscataway; Dennis George Peiffer, Annandale, both of N.J.; Christine Ann Costello, Easton, Pa.; Karla Schall Colle, Houston, Tex.; Pamela J Wright, Easton, Pa., and Larry Dalton Talley, Friendswood, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

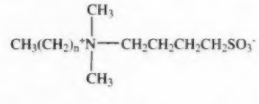
Continuation-in-part of application No. 08/747,949, Nov. 12, 1996, abandoned, which is a continuation of application No. 08/306,350, Sep. 15, 1994, abandoned. This application Feb. 13, 1998, Appl. No. 23,580.

Int. Cl.[7] C07C *7/20;* **F17D** *1/05*

U.S. Cl. 585—15 **7 Claims**

1. A method for inhibiting the aggregation of clathrate hydrates in a mixture of hydrate forming substituents and water at a temperature approximately at or above T_{eq} comprising:

adding into the mixture of hydrate forming substituents and water an effective amount of a hydrate anti-agglomerate having a polar head group directly connected to a nonpolar tail group selected from the group consisting of sodium valerate, 1 -butanesulfonic acid Na salt, butanesulfate Na salt, a zwitterion having the formula



wherein n ranges from 3 to 7, and mixtures thereof.

6,015,930

METHOD OF MAKING 2,6-DIMETHYLNAPHTHALENE FROM OTHER DIMETHYLNAPHTHALENE ISOMERS AND FROM DIMETHYLTETRALINS/ DIMETHYLDECALINS WITH A METHYL GROUP ON EACH RING

Donald S. Santilli, Larkspur, and Cong-Yan Chen, Richmond, both of Calif., assignors to Chevron Chemical Company, San Ramon, Calif.

Filed Jul. 14, 1997, Appl. No. 892,508

Int. Cl.[7] C07C *1/00;5/22*

U.S. Cl. 585—320 **18 Claims**

1. A method of making 2,6-dimethylnaphthalene comprising:

(a) contacting a hydrocarbon feed comprising a dimethylnaphthalene isomer or mixture of isomers selected from the group consisting of 1,6-dimethylnaphthalene, 1,5-dimethylnaphthalene, 2,7-dimethylnaphthalene, 1,7-dimethylnaphthalene, 1,8-dimethylnaphthalene, and partially or fully hydrogenated counterparts thereof with a catalyst, the catalyst being a combination of an acidic catalyst with a metal, in the presence of hydrogen gas to obtain a hydroisomerized mixture comprising 2,6-dimethyltetralin, 2,6-dimethyldecalin; and

(b) contacting the hydroisomerized mixture with a reforming catalyst to dehydrogenate the hydroisomerized mixture thus obtaining a dehydrogenated mixture comprising 2,6-dimethylnaphthalene.

6,015,931

PROCESS TO CONVERT PROPANE INTO ETHYLENE PROPENE AND C_4 OLEFINS

An-hsiang Wu, Bartlesville, and Charles A. Drake, Nowata, both of Okla., assignors to Phillips Petroleum Company

Filed Oct. 27, 1998, Appl. No. 179,774

Int. Cl.[7] C07C *4/02;5/333*

U.S. Cl. 585—649 **6 Claims**

1. A process to convert propane into ethylene, propene, and C_4 olefins, said process comprising: contacting said propane with a composition under converting conditions;

where said composition comprises

a zeolite component

at least one Group 2 metal,

at least one metal selected from the group consisting of Group 8, Group 9, or Group 10 metals,

a binder component, and

where said converting conditions comprise

a temperature from about 100° C. to about 1000° C., and

a pressure from sub-atmospheric to super-atmospheric.

6,015,932

REACTIVATION OF A HIGH-ACTIVITY ISOMERIZATION CATALYST

Stanley J. Frey, Palatine, Ill., assignor to UOP LLC, Des Plaines, Ill.

Filed Aug. 28, 1998, Appl. No. 143,069

Int. Cl.[7] B01J *27/02*

U.S. Cl. 585—751 **20 Claims**

1. In a process for the isomerization of a naphtha feedstock to obtain an isomerized product having an increased isoparaffin content at paraffin- isomerization conditions comprising an isomerization temperature of from 40 to 250° C. in the presence of a solid strong-acid isomerization catalyst comprising an anion-modified metal oxide and a zerovalent platinum-group metal component thereby effecting a loss in isomerization activity of the catalyst and obtaining a deactivated catalyst, the improvement which comprises contacting the deactivated catalyst with a totally liquid-phase hydrocarbon stream at reactivation conditions comprising a reactivation temperature at least about 20° C. lower than the isomerization temperature to obtain a reactivated catalyst and reutilizing the reactivated catalyst in the isomerization process.

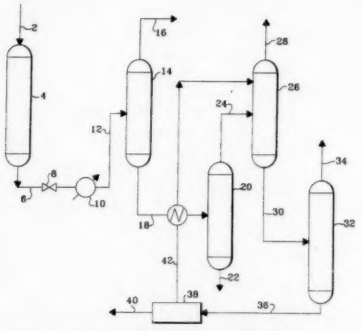
13. In a process for the isomerization of a naphtha feedstock to obtain an isomerized product having an increased isoparaffin content at paraffin- isomerization conditions comprising an isomerization temperature of from 40 to 250° C. in the presence of a solid strong-acid isomerization catalyst comprising sulfated zirconia and a platinum-group metal component thereby effecting a loss in isomerization activity of the catalyst and obtaining a deactivated catalyst, the improvement which comprises contacting the deactivated catalyst with a totally liquid- phase hydrocarbon stream at reactivation conditions comprising a reactivation temperature at least about 20° C. lower than the isomerization temperature to obtain a reactivated catalyst and reutilizing the reactivated catalyst in the isomerization process.

17. In a process for the isomerization of a naphtha feedstock to obtain an isomerized product having an increased isoparaffin content at paraffin- isomerization conditions comprising an isomerization temperature of from 40 to 250° C. in the presence of a solid strong-acid isomerization catalyst comprising alumina-bound sulfated zirconia and a platinum-group metal component thereby effecting a loss in isomerization activity of the catalyst and obtaining a deactivated catalyst, the improvement which comprises contacting the deactivated catalyst with a totally liquid-phase hydrocarbon stream at reactivation conditions comprising a reactivation temperature at least about 20° C. lower than the isomerization temperature to obtain a reactivated catalyst and reutilizing the reactivated catalyst in the isomerization process.

6,015,933
PROCESS FOR REMOVING POLYMERIC BY-PRODUCTS FROM ACETYLENE HYDROGENATION PRODUCT

Hayim Abrevaya, Wilmette, and Bipin V. Vora, Darien, both of Ill., assignors to UOP LLC, Des Plaines, Ill.

Filed Jul. 15, 1998, Appl. No. 115,481
Int. Cl.[7] **C07C** *7/00;* **C07O** *7/10*
U.S. Cl. 585—810 **12 Claims**



1. A process for removing polymeric by-products from the product of the selective hydrogenation of acetylenes in a liquid stream containing largely butadiene, said product containing at least hydrogen, butadiene, and polymeric by-products having from about 8 to about 36 carbon atoms; said process comprising:

a) removing at least a portion of the hydrogen from the product in a low pressure flash drum to provide a low pressure flash drum effluent;

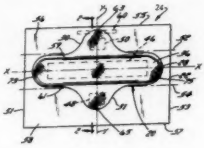
b) separating and removing polymeric by-products having about 12 or more carbon atoms from the low pressure flash drum effluent by phase separation to produce an overhead stream containing at least butadiene and polymeric by-products having less than about 12 carbon atoms and a bottoms stream containing polymeric by-products having about 12 or more carbon atoms; and

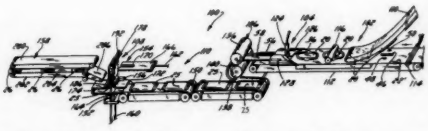
c) separating and removing polymeric by-products having less than about 12 carbon atoms from the overhead stream by extractive distillation.

6,015,934
INDIVIDUALLY WRAPPED ABSORBENT ARTICLE AND METHOD AND APPARATUS FOR ITS PRODUCTION

Colin Lee, Oshkosh, and Kenneth Triebold, Appleton, both of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation-in-part of application No. 08/968,446, Nov. 12, 1997. This application Dec. 22, 1997, Appl. No. 995,490.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] **A61F** *13/15*
U.S. Cl. 604—358 **25 Claims**





1. A method of tri-folding a package containing a wrapped absorbent article to form a pouch, said method comprising:

a) conveying said package along a travel path;

b) while said package travels along said travel path, rotating a tri-folding mechanism in contact with said package while translating said tri-folding mechanism at least generally along said travel path so as to

i) fold a first longitudinal flap of said package about a central portion of said package so that said first longitudinal flap is aligned adjacent to said central portion; and

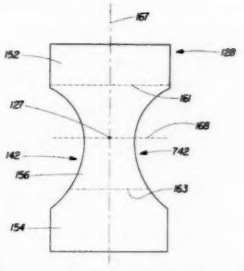
ii) fold said first longitudinal flap and said central portion of said package about a second longitudinal flap of said package so that said second longitudinal flap is aligned adjacent to said first longitudinal flap; and

c) releasably securing said second longitudinal flap to said first longitudinal flap to form said pouch.

6,015,935
ABSORBENT ARTICLES COMPRISING A MATERIAL HAVING A HIGH VERTICAL WICKING CAPACITY

Gary Dean LaVon, Middletown; Gerald Alfred Young, Cincinnati, and Gregory Wade Taylor, Forest Park, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 27, 1997, Appl. No. 825,071
Int. Cl.[7] **A61F** *13/15;13/20*
U.S. Cl. 604—378 **48 Claims**



1. An absorbent core having a crotch region, wherein (i) the crotch region has an absorbent capacity of not more than about 40% of the absorbent core's total absorbent capacity and (ii) the

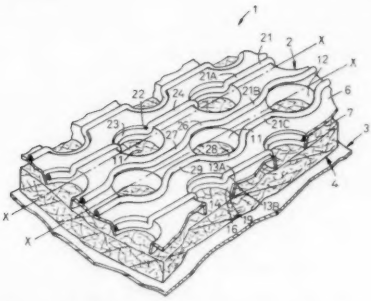
crotch region comprises a material having a vertical wicking capacity of at least about 15 g/g at a height of 2 cm.

6,015,936

BODY FLUIDS ABSORBENT ARTICLE

Hisashi Takai; Hiroki Goda, and Tomoko Tsuji, all of Kagawa, Japan, assignors to Uni-Charm Corporation, Ehime-ken, Japan

Filed Aug. 3, 1998, Appl. No. 128,449
Claims priority, application Japan, Sep. 4, 1997, 9-239610
Int. Cl.[7] A61F *13/15*
U.S. Cl. 604—383 **15 Claims**



1. A body fluids absorbent article which comprises:

a liquid-permeable top sheet having:

a skin-contactable surface which contacts the skin of a wearer of the article;

a skin-noncontactable surface which does not contact the skin of a wearer of the article; and

a plurality of openings that extend between the skin-contactable surface and the skin-noncontactable surface which openings are aligned in a two-dimensional array;

a liquid-impermeable backsheet;

a liquid-absorbent core positioned between the liquid-permeable topsheet and the liquid-impermeable backsheet; and

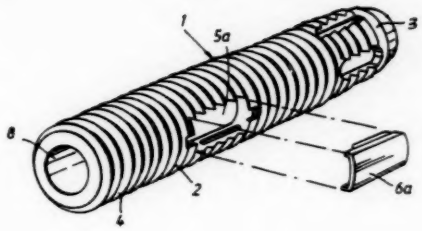
a plurality of deformation preventing strands which extent along and are bonded to circumferential portions of a number of the plurality of the openings and thereby prevent deformation of the openings.

6,015,937

IMPLANTABLE ANCHORING ELEMENT AND ANCHORING ASSEMBLY FOR PROSTHESES

Per-Ingvar Brånemark, Molndal, Sweden, assignor to Medevelop AB, Gothenburg, Sweden

Continuation of application No. 08/644,699, May 10, 1996, abandoned, which is a continuation of application No. 08/466,574, Jun. 6, 1995, abandoned, which is a division of application No. 08/233,526, Apr. 4, 1994, abandoned. This application Aug. 21, 1997, Appl. No. 916,064.
Claims priority, application Sweden, Apr. 27, 1993, 9301405
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A61F *2/28*
U.S. Cl. 623—16 **11 Claims**



1. Apparatus for use in prosthetic surgery, comprising:

(i) a substantially rotationally symmetrical anchoring element made of a tissue compatible material, for implantation in tissue, the anchoring element having a peripheral surface which has an external screw thread, the anchoring element having an insertion end which is the leading end thereof during insertion of the anchoring element in tissue and having an opposite application end, the anchoring element having a slot extending radially into the element and only extending partially across the anchoring element to an opposite side of the anchoring element, the slot being located at a distance from the insertion end,

(ii) a blanking element dimensioned to fit in the slot to fill the slot and shield the slot during the application of the anchoring element into a recess prepared in the tissue and during subsequent healing of the tissue around the anchoring element,

(iii) means for releasably retaining the blanking element in its position filling the slot,

(iv) a prosthesis component having a portion formed for engagement with the anchoring element in place of the blanking element, the prosthesis component having a portion which occupies the slot when the prosthesis component is fitted to the anchoring element.

6,015,938

OSTEOPROTEGERIN

William J. Boyle, Moorpark; David L. Lacey, Thousand Oaks; Frank J. Calzone, Westlake Village, and Ming-Shi Chang, Newbury Park, all of Calif., assignors to Amgen Inc., Thousand Oaks, Calif.

Division of application No. 08/577,788, Dec. 22, 1995. This application Nov. 18, 1997, Appl. No. 974,022.
Int. Cl.[7] C12N *5/00*
U.S. Cl. 800—18 **2 Claims**

1. A transgenic non-human mammal having integrated into its genome a nucleic acid sequence encoding osteoprotegerin operatively linked to regulatory elements, wherein expression of said coding sequence increases the level of osteoprotegerin and the bone density of said mammal relative to a non-transgenic mammal of the same species, wherein the coding sequence is selected from the group consisting of:

a) a nucleic acid encoding a polypeptide comprising the amino acid sequence from residue 1 to 401 or from residue 22 to 401 of SEQ ID NO:2, SEQ ID NO:4 or SEQ ID NO:6; and

b) a nucleic acid encoding a polypeptide having the biological activity of inhibiting bone resorption wherein the nucleic acid hybridizes with the nucleic acid in (a) under conditions comprising hybridization at 5× SSC, 50% formamide and 42° C. and washing at 0.5× SSC and 55° C.

6,015,939

PLANT VDE GENES AND METHODS RELATED THERETO

Harry Y. Yamamoto; Robert C. Bugos, and David C. Rockholm, all of Honolulu, Hi., assignors to Calgene LLC, Davis, Calif.

Provisional application No. 60/023,502, Aug. 6, 1996, Provisional application No. 60/006,315, Nov. 7, 1995. This application Nov. 7, 1996, Appl. No. 747,574.
Int. Cl.[7] C12N *5/04;15/29;15/82;* **A01H** *5/00*
U.S. Cl. 800—278 **18 Claims**

1. An isolated DNA sequence encoding plant violaxanthin de-epoxidase.

3. A recombinant DNA construct capable of directing the transciption of RNA in a plant cell, wherein said construct comprises in the order of transcription, a plant transcription initiation region, the violaxanthin de-epoxidase encoding sequence of claim 1, and a transcriptional termination region.

14. A transgenic plant with modified sensitivity to light as a consequence of the activity of an introduced construct according to claim 3.

6,015,940

VIRUS RESISTANT POTATO PLANTS

Wojciech Kazimierz Kaniewski, Chesterfield; Jennifer Katherine Lodge, St. Louis, and Nilgun Ereken Tumer, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 7, 1992, Appl. No. 865,169

Int. Cl.[7] **C12N** *15/29;15/62;15/82;* **A01H** *5/00;5/06*

U.S. Cl. 800—279 **20 Claims**

1. A potato plant comprising a heterologous gene capable of causing the expression of a pokeweed antiviral protein in said plant at a level sufficient to render said plant resistant to infection by a virus selected from the group consisting of potato virus X and potato virus Y.

6,015,941

PEPTIDE DERIVATIVES OF TACHYPLESIN HAVING ANTIMICROBIAL ACTIVITY

A. Gururaj Rao, Urbandale, Iowa, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Oct. 31, 1997, Appl. No. 962,034

Int. Cl.[7] **C12N** *15/29;5/04;* **A01H** *5/00;4/00*

U.S. Cl. 800—279 **24 Claims**

1. A compound of the formula SEQ ID NO:2:

$$KWX_1FRVX_2YRGIX_3YRRX_4R$$

wherein X_1, X_2, X_3, and X_4 is one amino acid selected from the group consisting of isoleucine, valine, methionine, phenylalanine, tyrosine, wherein $X_{1\text{-}4}$ are the same amino acid.

7. A method of protecting a plant from pathogens said method comprising subjecting said plant to a pathogen-inhibiting amount of an antimicrobial compound, said compound is of the formula SEQ ID NO: 2:

$$KWX_1FRVX_2YRGIX_3YRRX_4R$$

wherein X_1, X_2, X_3, and X_4 is one amino acid selected from the group consisting of isoleucine, valine, methionine, phenylalanine, tyrosine, wherein $X_{1\text{-}4}$ are the same amino acid.

13. A transformed plant comprising within its genome a chimeric gene said gene comprising a promoter which drives expression in a plant cell operably linked to a nucleotide sequence encoding an antimicrobial peptide of the formula SEQ ID NO: 2:

$$KWX_1FRVX_2YRGTX_3YRRX_4R$$

wherein X_1, X_2, X_3, and X4 is one amino acid selected from the group consisting of isoleucine, valine, methionine, phenylalanine, tyrosine, where $X_{1\text{-}4}$ is the same amino acid, wherein said sequence is operably linked to a promoter which expresses in a plant cell.

6,015,942

TRANSGENIC PLANTS EXHIBITING HETEROLOGOUS VIRUS RESISTANCE

David M Tricoli; Kim J. Carney, both of Davis, Calif., and Paul F. Russell, Portage, Mich., assignors to Seminis Vegetable Seeds, Inc., Saticoy, Calif.

PCT No. PCT/US95/06263, § 371 Date Oct. 6, 1997, § 102(e) Date Oct. 6, 1997, PCT Pub. No. WO96/21032, PCT Pub. Date Jul. 11, 1996

Continuation-in-part of application No. 08/367,016, Dec. 30, 1994, abandoned. This PCT application Jun. 7, 1995, Appl. No. 860,543.

Int. Cl.[7] **C12N** *5/04;15/33;15/82;* **A01H** *1/00*

U.S. Cl. 800—280 **8 Claims**

1. A method of increasing virus resistance to a plant which is susceptible to viruses, comprising:

(a) transforming cells of said susceptible plant with a chimeric recombinant DNA molecule comprising a promoter functional in cells of said plant and operably linked to a DNA sequence encoding a coat protein isolated from a cucumber mosaic virus which is capable of infecting said plant;

(b) regenerating said plant cells to provide a differentiated plant; and

(c) identifying a transformed plant which expresses said coding DNA coat protein sequence so as to increase the resistance of the plant to infection by said cucumber mosaic virus, wherein the plant further exhibits increased resistance to infection by at least one potyvirus.

6,015,943

DNA SEQUENCES CODING FOR A CINNAMOYL COA REDUCTASE AND THEIR USES IN THE FIELD OF REGULATING THE LIGNIN LEVELS OF PLANTS

Alain Boudet, Toulouse; Jacqueline Pettenati, Fourqueveaux; Deborah Goffner, Vieille Toulouse, all of France; Claire Halpin, Fife; Ann O'Connell, Weybridge, both of United Kingdom; Michel Romestant, Rodez, France; Wout Boerjan, Kalken, Belgium, and Jean-Charles Leple, Ferolles, France, assignors to Centre National de la Recherche Scientifique, France

PCT No. PCT/FR95/00465, § 371 Date Feb. 24, 1997, § 102(e) Date Feb. 24, 1997, PCT Pub. No. WO95/27790, PCT Pub. Date Oct. 19, 1995

PCT Filed Apr. 11, 1995, Appl. No. 722,184

Claims priority, application France, Apr. 11, 1994, 94/04246

Int. Cl.[7] **C12N** *15/00;15/29;15/82;* **A01H** *4/00*

U.S. Cl. 800—298 **20 Claims**

1. A method of producing transgenic plants within which the biosynthesis of lignins is regulated either in the sense of an increase, or in the sense of a reduction of the lignin levels produced, relative to the normal lignin levels produced in plants comprising:

transforming plant cells with a recombinant nucleotide sequence comprising one or more coding regions, wherein said coding regions are selected from the group consisting of:

the nucleotide sequence represented by SEQ ID NO 1, coding for a mRNA, said mRNA coding for the CCR of eucalyptus represented by SEQ ID NO 2,

the nucleotide sequence represented by SEQ ID NO 3, coding for a mRNA, said mRNA coding for the CCR of poplar represented by SEQ ID NO 4,

the nucleotide sequence represented by SEQ ID NO 5, coding for a mRNA, said mRNA coding for the CCR of fescue represented by SEQ ID NO 6,

the nucleotide sequence represented by SEQ ID NO 7, coding for a mRNA, said mRNA coding for the CCR of tobacco represented by SEQ ID NO 8,

the nucleotide sequence represented by SEQ ID NO 9, coding for a mRNA, said mRNA coding for a protein represented by SEQ ID NO 10, derived from the eucalyptus CCR, and

the nucleotide sequence complementary to that represented by SEQ ID NO 1, SEQ ID NO 3, SEQ ID NO 5, SEQ ID NO 7 or SEQ ID NO 9, said complementary sequence coding for an anti sense mRNA capable of hybridizing with the mRNA coded by sequences SEQ ID NO 1, SEQ ID NO 3, SEQ ID NO 5, SEQ ID NO 7 and SEQ ID NO 9, respectively.

6,015,944

INBRED CORN LINE LH284

Terry J. Foley, Williamsburg, Iowa, assignor to Holden's Foundation Seeds, Inc., Williamsburg, Iowa

Filed Dec. 9, 1997, Appl. No. 987,013

Int. Cl.[7] **A01H** *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—320.1 **15 Claims**

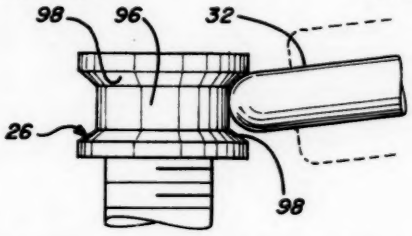
1. An inbred corn seed designated LH284 having ATCC accession No. 203975.

6,015,945

TREMOLO BRIDGE APPARATUS

David J. Borisoff, Romulus, N.Y., assignor to Hipshot Products, Inc., Interlaken, N.Y.

Filed Dec. 23, 1998, Appl. No. 220,881
Int. Cl.[7] G10D *3/00*
U.S. Cl. 84—313 25 Claims



25. A tremolo bridge support bearing system for a guitar, comprising:

a support post carried by a guitar, the support post further comprising a bearing seat surface segment having a longitudinal axis and a first end and a second end, the bearing seat segment further comprising a first frustoconical segment having a decreasing radius along the longitudinal axis in a direction from the first end of the bearing segment to the second end of the bearing segment, and a second frustoconical segment having an increasing radius along the longitudinal axis in a direction from the first end of the bearing segment to the second end of the bearing segment, and a right circular cylindrical segment intermediate the first and second frustoconical segments;

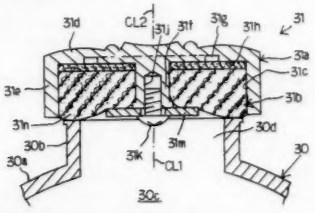
a rocker having a curved surface in contact with the bearing seat surface segment of the support post, the rocker being carried by the tremolo bridge and facilitating a smooth relative movement between the bridge and the guitar body to provide a tremolo effect.

6,015,946

WOODWIND INSTRUMENT HAVING KEY CUPS REGULATED IN WEIGHT FOR GIVING APPROPRIATE TOUCH TO PLAYER

Shigeru Yamaryo, Shizuoka, Japan, assignor to Yamaha Corporation, Japan

Filed Jun. 16, 1998, Appl. No. 97,967
Claims priority, application Japan, Jun. 16, 1997, 9-158435
Int. Cl.[7] G10D *7/00*
U.S. Cl. 84—380 R 6 Claims



1. A woodwind instrument comprising

a tube body having at least one tone hole, and

a key mechanism attached to said tube body and including

at least one tampon movable between a first position for opening said tone hole and second position for closing said tone hole and

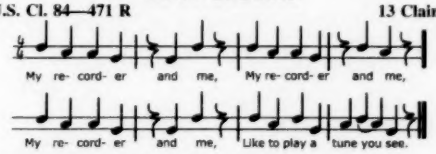
a key cup having a wall portion and a bottom portion defining a recess together with said wall portion for receiving said tampon, said bottom portion having a groove open to said recess for regulating the weight of said key cup.

6,015,947

METHOD OF TEACHING MUSIC

Kathryn L. Moberg, Box 281, Clinton, Minn. 56225

Provisional application No. 60/073,642, Feb. 4, 1998. This application Jan. 28, 1999, Appl. No. 239,102.
Int. Cl.[7] G09B *15/02*
U.S. Cl. 84—471 R 13 Claims



1. A method of teaching music comprising:

a) teaching rote understanding of musical skills to the student;

b) teaching basic structural elements of music to the student by using a two-line staff;

c) teaching a five-line staff to the student;

d) teaching rhythm to the student; and

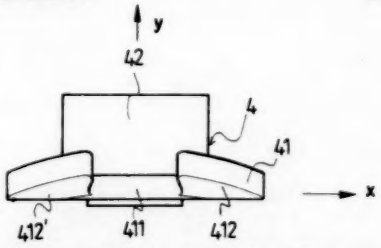
e) teaching the integration of steps c) and d) to the student.

6,015,948

STRUCTURE OF METRONOME

Wei-Tsung Yang, No. 1, Sec. 4, Tzu-Chiang Rd., Sanchung City, Taipei Hsien, Taiwan

Filed Feb. 18, 1999, Appl. No. 252,472
Int. Cl.[7] G09B *15/00*
U.S. Cl. 84—484 1 Claim



1. A metronome comprising an oscillating shaft, an escapement mechanism formed of an actuating member and an escapement wheel having two staggered rows of sloping teeth around the periphery of said escapement wheel, and a driving mechanism operated by the user to rotate said escapement wheel, causing said oscillating shaft be turned back and forth with said actuating member, wherein said actuating member comprises a copper bushing fixedly coupled to a part of said oscillating shaft, and a circular plate securely mounted on one end of said copper bushing, said circular plate comprising a peripheral notch fitted with the sloping teeth of said escapement wheel, and two sloping portions symmetrically disposed at two opposite sides of said peripheral notch, said sloping portions respectively tilted inwards in X-axis direction and sloping backwards in Y-axis direction.

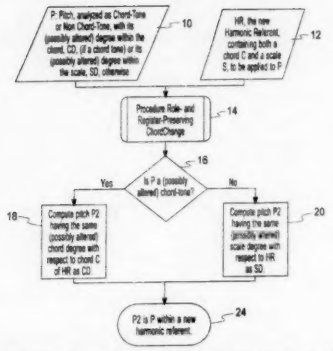
6,015,949

SYSTEM AND METHOD FOR APPLYING A HARMONIC CHANGE TO A REPRESENTATION OF MUSICAL PITCHES WHILE MAINTAINING CONFORMITY TO A HARMONIC RULE-BASE

Daniel P. Oppenheim, Croton-on-Hudson; Steven R. Abrams, New City; Donald P. Pazel, Montrose, and James L. Wright, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1998, Appl. No. 78,042
Int. Cl.[7] G10H *1/38;7/00*
U.S. Cl. 84—613 19 Claims

1. A method in a computer system for applying a new harmonic referent to a musical sample, the sample comprising a sequence of


P: Pitch, analyzed as Chord-Tone or Non Chord-Tone, with its (possibly altered) degree within the chord, CD, (if a chord tone) or its (possibly altered) degree within the scale, SD, otherwise
10
HR, the new Harmonic Referent, containing both a chord C and a scale S, to be applied to P
12
Procedure Role- and Register-Preserving ChordChange
14
16
Is P a (possibly altered) chord-tone?
Yes
No
18
Compute pitch P2 having the same (possibly altered) chord degree with respect to chord C of HR as CD
Compute pitch P2 having the same (possibly altered) scale degree with respect to HR as SD
20
P2 is P within a new harmonic referent
24

pitches, said musical sample having been analyzed, said analysis yielding an inherent harmonic referent, the method applied to each pitch in the musical sample, the method comprising:

a) computing a compatible pitch having an analysis with respect to the new harmonic referent compatible with that of the original pitch with respect to the inherent harmonic referent; and

b) using said compatible pitch in place of the original pitch in the changed sample.

6,015,950

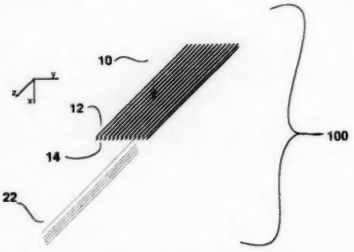
REFRACTIVE SPECTRUM SPLITTING PHOTOVOLTAIC CONCENTRATOR SYSTEM

Alexander K. Converse, P.O. Box 1349, Madison, Wis. 53701-1349

Filed May 13, 1997, Appl. No. 855,405

Int. Cl.[7] **H01L** *31/052;* **H01M** *6/36;* **H01J** *3/14*

U.S. Cl. 136—246 **10 Claims**



1. A device for concentrating approximately collimated light having a broad photon energy spectrum onto regions of focus, comprising two pluralities of refracting elements arranged so a ray of said collimated light passes through one of said refracting elements in each of said pluralities and through a gap between said refracting elements,

whereby said refracting elements act together to disperse and redirect said collimated light,

whereby the area of said regions of focus exposed to the dispersed and redirected light is smaller than the area of said pluralities of refracting elements exposed to said collimated light, and

whereby each of said regions of focus receives light having a photon energy spectrum that is narrower than said broad photon energy spectrum.

6,015,951

PHOTOELECTRIC TRANSFER DEVICE

Keizo Ikai, Kanagawa-ken, and Mitsuo Matsuno, Yokohama, both of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Nov. 20, 1997, Appl. No. 975,089

Int. Cl.[7] **H01L** *31/0216;* **G02F** *1/133*

U.S. Cl. 136—257 **10 Claims**

1. A photoelectric transfer device which comprises a photoelectric transfer element, a cholesteric liquid crystalline polymer film layer and an ultraviolet cut-off layer, said cholesteric liquid crystalline polymer layer being arranged between said photoelectric transfer element and said ultraviolet cut-off layer, and said ultraviolet cut-off layer being arranged at the side for the incidence of light.

6,015,952

GROMMET AND METHOD FOR ARRANGING THE SAME AND USE THEREOF

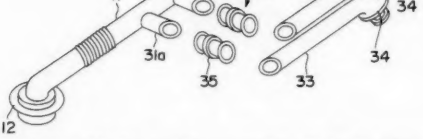
Keisuke Mori, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed May 27, 1998, Appl. No. 85,438

Claims priority, application Japan, Jun. 9, 1997, 9-150759

Int. Cl.[7] **H02G** *3/00*

U.S. Cl. 174—72 R **8 Claims**



1. An assembly for providing a routing of electric wires to hinged members for a vehicle body, said assembly comprising:

said vehicle body having a through hole for accommodating a plurality of wires;

said wires extending from the through hole in the vehicle body;

a first member movably disposed in proximity to the vehicle body, the first member having a through hole therein, and at least a first of said wires extending into the through hole of the first member;

a second member movably disposed in proximity to said first member and movably disposed in proximity to said vehicle body, said second member having a through hole therein, and at least a second of said wires extending into the through hole of the second member,

an elastomeric grommet for providing waterproof protection for said wires for all ranges of movement of said first and second members, said grommet comprising: a main tube having a widely open first end, a closed second end and a hollow passage extending therebetween, said first end being configured for water-tight connection to said through hole in said vehicle body; first and second branch tubes each having a widely open leading end, a widely open base end and a hollow passage extending continuously therebetween, said base ends of said branch tubes being securely connected to said main tube at a locations between said first and second ends such that the hollow passages of the branch tubes communicate with the hollow passage of the main tube, said leading end of said first branch tube being configured for water-tight connection to said through hole in said first member, said leading end of said second branch tube being configured for water-tight connection to said through hole in said second member, at least said first of said wires being directed from the vehicle body, through the hollow passages of the main tube and the first branch tube and into the first member, and at least the second of said wires being directed from the vehicle body, through the hollow passages of the main tube

and the second branch tube and into the second member, said wires and said grommet being dimensioned to provide clearance between said wires within the grommet as the first and second members move.

6,015,953

TENSION CLAMP FOR STRANDED CONDUCTOR

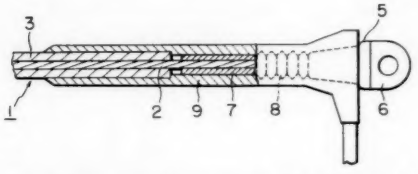
Shigeru Tosaka; Syuji Tachizaki; Kouetu Sato, all of Sendai; Yoshihiro Takahashi, Miyagi-ken; Hiroshi Kimura, Chiba-ken; Hiroshi Tajima, Tochigi-ken; Haruki Susukida, Yokohama; Jun Sato, Saitama-ken; Masakazu Kojima, Tokyo; Hirotoshi Ebiko, Kanagawa-ken, and Takeshi Ito, Yokohama, all of Japan, assignors to Tohoku Electric Power Co., Inc., Sendai; Tokyo Rope Mfg. Co; Sanwa Tekki Corporation, both of Tokyo, and Showa Electric Wire & Cable Co. Ltd., Kawasaki, all of Japan

Continuation of application No. 08/403,001, Mar. 10, 1995, abandoned. This application Mar. 28, 1997, Appl. No. 827,473.

Claims priority, application Japan, Mar. 11, 1994, 6-040994; Mar. 11, 1994, 6-040995; Feb. 24, 1995, 7-036703; Feb. 24, 1995, 7-036704

Int. Cl.[7] **H01R** *4/18*

U.S. Cl. 174—79 **24 Claims**



1. An apparatus comprising a tension clamp for a conductor having a tension member comprising carbon fiber and a stranded conductor layer wound around the tension member, the apparatus comprising:

a tension member comprising an exposed end section;

a stranded conductor layer wound around the tension member, the stranded conductor layer comprising a stranded conductor layer end section;

a metal fitting substantially directly attached to the exposed end section of the tension member, the metal fitting comprising a tension member insertion section, a peripheral wall of which forms a slit section comprising multiple longitudinal slits, the metal fitting housing the exposed end section of the tension member within the slit section of the tension member insertion section; and

a metal sleeve compress-fitted on the stranded conductor layer end section and the tension member insertion section whereby the multiple longitudinal slits of the slit section of the tension member insertion section are closed by fitting the metal sleeve in place from the stranded conductor layer end section over to the metal fitting and compressing the metal sleeve.

6,015,954

MULTI-LAYER BALLISTIC CABLE PROTECTOR

Martin Hochuli, and Robert Dietrich, both of Domat/Ems, Switzerland, assignors to Ems-Inventa AG, Zürich, Switzerland

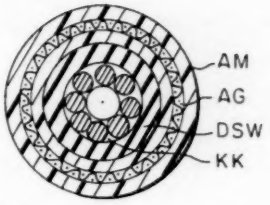
Filed Apr. 22, 1997, Appl. No. 838,053

Claims priority, application Germany, Apr. 24, 1996, 196 16 374; European Pat. Off., Mar. 20, 1997, 97104769

Int. Cl.[7] **H01B** *7/00*

U.S. Cl. 174—110 R **20 Claims**

1. For an optical cable, a multi-layer ballistic cable protector comprising:



(a) a fiber layer;

(b) a hard impact-resistant plastic sheathing layer comprising an impact-resistant plastic having a modulus of elasticity between approximately 200 N/mm^2 and approximately 2000 N/mm^2, a Charpy notched impact strength of approximately at least 10 kJ/m^2, and a penetration energy of approximately at least 60 N-m as measured according to DIN 53 373;

wherein the impact-resistant plastic is selected from a group consisting of polyamides, polyesters, polyester elastomers, and blends thereof;

(c) an outer protective layer comprising polyolefin.

6,015,955

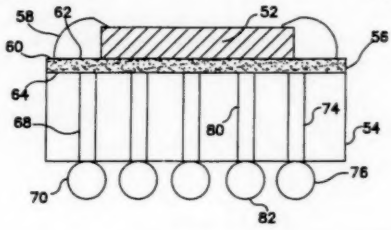
REWORKABILITY SOLUTION FOR WIREBOUND CHIPS USING HIGH PERFORMANCE CAPACITOR

Mukta Shaji Farooq, Hopewell Junction; Raymond Alan Jackson, Fishkill, and Sudipta Kumar Ray, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1997, Appl. No. 879,718

Int. Cl.[7] **H05K** *7/02*

U.S. Cl. 174—260 **11 Claims**



1. An apparatus for enabling the reworkability and operation of an integrated circuit comprising:

a wirebond chip having a bottom surface,

a carrier substrate having

1) a first surface,

2) a second surface, and

3) connecting means for connecting the first surface of the carrier substrate to the second surface of the carrier substrate,

a dielectric laser attached to the first surface of the carrier substrate and having an upper surface and a lower surface, and

attaching means for directly attaching the wirebond chip to the dielectric layer,

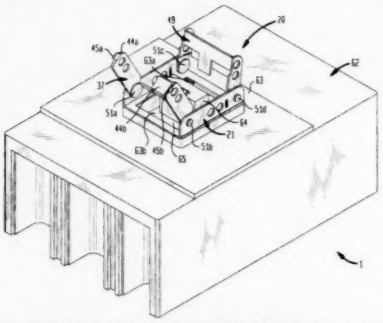
wherein the dielectric layer has a metal layer on said upper surface.

6,015,956

CIRCUIT BREAKER MOVABLE ACTUATOR BLOCKING AND SECURING METHOD

Russell B. Green, Douglasville, Ga., assignor to Siemens Energy Automotation, Alpharetta, Ga.

Filed Jun. 25, 1997, Appl. No. 876,355
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H01H *9/28*
U.S. Cl. 200—43.14 **13 Claims**



1. A method for securing a circuit breaker having a movable actuator which extends through a circuit breaker face plate and which has at least two positions, the method comprising the steps of:

providing a circuit breaker movable actuator locking apparatus that comprises a main frame member, a first sub-frame member, and a second sub-frame member;

moving a fastening portion of the main frame member of the circuit breaker movable actuator locking apparatus into a portion of an aperture located at one end of the movable actuator so as to seat the main frame member adjacent to the circuit breaker face plate;

moving the first sub-frame member with respect to the main frame member so as to move a fastening portion of the first sub-frame member into another portion of the aperture located at another end of the movable actuator so as to seat the first sub-frame member adjacent to the main frame member and the circuit breaker face plate; and

then moving the second sub-frame member with respect to both the main frame member and the first sub-frame member, by pivoting the second sub-frame member on the main frame member relative both to the main frame member and the first sub-frame member, to position a blocking portion of the second sub-frame member so as to block substantial movement of the movable actuator.

6,015,957

HIGH AMPACITY PINLESS CONDUCTING JOINT IN MOVABLE CONTACT ARM ASSEMBLY

Thomas F. Papallo, Jr., Farmington; Raymond K. Seymour, and Anupam Tiwari, both of Plainville, all of Conn., assignors to General Electric Company, Schenectady, N.Y.

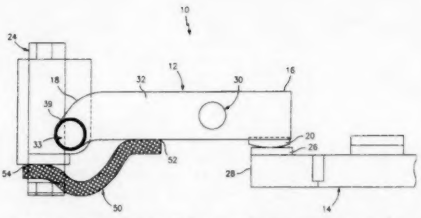
Filed Dec. 31, 1998, Appl. No. 223,743
Int. Cl.[7] H01H *9/30*
U.S. Cl. 200—244 **10 Claims**

1. A movable contact arm assembly for air circuit breakers comprising:

an electrically-conductive support having at least one slot formed therein, the at least one slot being defined in part by first and second walls;

a movable contact arm having first and second sides, a first end and an opposite second end, the first end being received within the at least one slot, and wherein the movable contact arm includes a movable contact attached to the second end;

a spring washer disposed on the first side of the movable contact arm proximate the first end thereof so that the spring washer



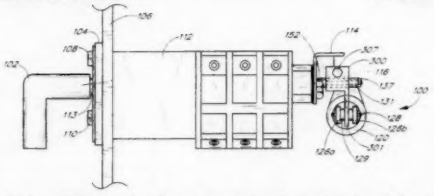
loads the second side of the movable contact arm against the second wall of the electrically-conductive support to form a conducting joint; and wherein the spring washer pivotally engages the first wall of the electrically-conductive support to provide a variable pivot point.

6,015,958

RETROFIT SWITCH ACTUATOR

Lawrence A. Pomatto, Santa Ana, and Ronald B. Tinkham, Solana Beach, both of Calif., assignors to Systems Integrated, Orange, Calif.

Continuation-in-part of application No. 08/615,592, Mar. 12, 1996, Pat. No. 5,762,180. This application Jan. 3, 1997, Appl. No. 778,670.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H01H *3/20*
U.S. Cl. 200—330 **34 Claims**



1. A switch actuator for a circuit breaker control switch, said circuit breaker control switch having a rotatable control switch output shaft, said switch actuator comprising:

a solenoid having an axially movable output shaft; and

an adapter coupled to said axially movable output shaft and adapted to be coupled to said control switch output shaft, said adaptor converting axial movement by the axially movable output shaft into rotational motion which turns the control switch output shaft about an axis of rotation of the control switch output shaft without any lateral movement of the control switch output shaft.

6,015,959

MOLDED CASE ELECTRIC POWER SWITCHES WITH CAM DRIVEN, SPRING POWERED OPEN AND CLOSE MECHANISM

Robert Michael Slepian, Murrysville, Pa.; William Christopher Farrow, Germantown; Michael Thomas Little, Cedarburg, both of Wis.; H. Richard Beck, Corapolis, Pa.; William George Eberts, Moontownship, Pa., and David Curtis Turner, Imperial, Pa., assignors to Eaton Corporation, Cleveland, Ohio

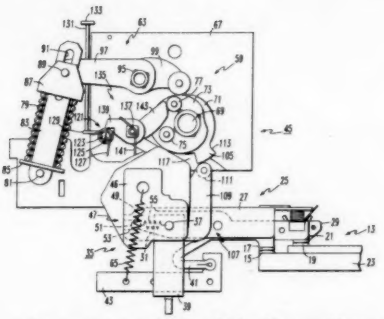
Filed Oct. 30, 1998, Appl. No. 183,464
Int. Cl.[7] H01H *5/00*
U.S. Cl. 200—400 **15 Claims**

1. An electric power switch comprising:

a molded casing;

at least one pole mounted in said molded casing and comprising:

a set of separable contacts including a stationary contact and a moveable contact; and



a moving contact assembly on which said moveable contact is mounted and moveable between a closed position in which said separable contacts are closed and an open position in which said separable contacts are open;

an operating mechanism mounted in said molded casing and comprising:

a cam assembly including a cam shaft and a drive cam mounted on said cam shaft;

an energy storage spring; and

coupling means coupling said energy storage spring to said cam assembly to rotate said cam shaft and with it said drive cam, said drive cam having a cam lobe configured to engage and move said moving contact assembly to said closed position closing said separable contacts as said cam assembly is rotated by said energy storage spring to a closed position, and configured to release said moving contact assembly through further rotation of said cam assembly including said drive cam by said energy storage spring to an open position; and

an opening spring biasing said moving contact assembly to said open position.

6,015,960

COMPRESSED GAS INTERRUPTER WITH A RACK MECHANISM

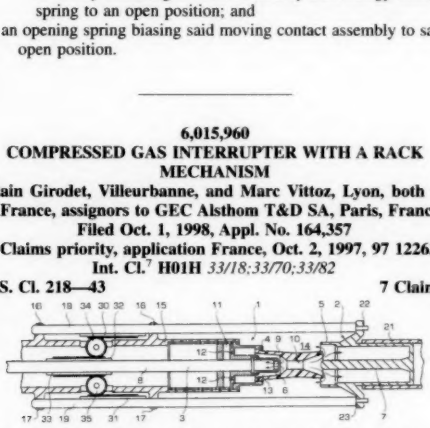
Alain Girodet, Villeurbanne, and Marc Vittoz, Lyon, both of France, assignors to GEC Alsthom T&D SA, Paris, France

Filed Oct. 1, 1998, Appl. No. 164,357

Claims priority, application France, Oct. 2, 1997, 97 12263

Int. Cl.[7] H01H *33/18;33/70;33/82*

U.S. Cl. 218—43 **7 Claims**



1. A compressed gas interrupter for opening and closing a circuit, comprising:

a first and second contact piece, said first contact piece having a hollow wear contact, said second contact piece having a rod-shaped wear contact, wherein said rod-shaped wear contact is inserted into said hollow wear contact during closing of the circuit;

an insulating nozzle disposed on a same axis as said first and second contact pieces, said insulating nozzle having a throat and being fixed to the first contact piece while the rod-shaped wear contact passes through the throat of said insulating nozzle, wherein said insulating nozzle connects a gas compression chamber to an exhaust chamber, and

wherein a rack mechanism is provided for opening the circuit by moving the rod-shaped wear contact of the second contact piece and the hollow wear contact of the first contact piece in directions opposite from one another along the axis, so that the first contact piece and the second contact piece are separated from each other, wherein the rack mechanism is disposed upstream from the throat of the insulating nozzle so that a flow of hot gasses escaping from the nozzle during opening of the circuit does not interfere with the rack mechanism.

6,015,961

EDM TOOL HOLDER

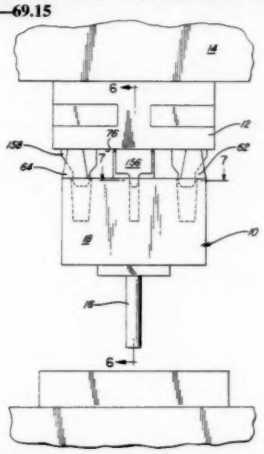
Robert J. Lozon, St. Clair, and Edward C. Olszewski, Smiths Creek, both of Mich., assignors to Precision Die & Machine Co., St. Clair, Mich.

PCT No. PCT/US97/23942, § 371 Date Oct. 23, 1998, § 102(e) Date Oct. 23, 1998, PCT Pub. No. WO99/33601, PCT Pub. Date Jul. 8, 1999

PCT Filed Dec. 24, 1997, Appl. No. 171,715

Int. Cl.[7] B23H *1/00;7/26;* **B29C** *45/00*

U.S. Cl. 219—69.15 **39 Claims**



1. A tool holder for electric discharge machining (EDM) comprising:

a block of molded plastic having means for mounting an EDM tool thereon;

said block shaped to provide locating reference faces integrally molded with the block and adapted to abut a mounting face on an EDM machine and thereby locate the block in a Z-direction on the EDM machine;

electric conductor means embedded in the block and having portions (a) exposed at said faces for electric contact with a mounting face on the EDM machine and (b) exposed for electric contact with a tool mounted on the block, whereby an electric circuit is completed between the tool and the EDM machine on which the holder is mounted; and

means for clamping the block on the EDM machine to urge said reference faces against the mounting face on such machine.

6,015,962

STUD HOLDER FOR A STUD-WELDING DEVICE

Hans Wiessler, Wettenberg, and Kurt Liebich, Lich, both of Germany, assignors to Emhart Inc., Newark, Del.

Filed Oct. 1, 1997, Appl. No. 941,923

Claims priority, application Germany, Oct. 2, 1996, 296 17 208 U

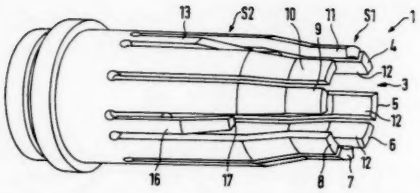
Int. Cl.[7] B23K *9/20*

U.S. Cl. 219—98 **20 Claims**

1. A stud holder for a stud-welding device, which comprises:

a through-duct having an outlet orifice at a first end thereof;

a common end region forming a portion of the through-duct at a location spaced from the first end thereof;



the common end region formed with an outboard end and an inboard end, with the outboard end being located at a second end of the through-duct opposite the first end thereof;

a first holder formed with a plurality of first-holder resilient holding fingers which are joined with and extend longitudinally in cantilever from the inboard end of the common end region in a direction away from the common end region for a first distance to the first end of the through-duct;

each of the plurality of first-holder resilient holding fingers formed with a holding portion located at a free end of the finger;

a second holder formed with a plurality of second-holder resilient holding fingers which are joined with and extend longitudinally in cantilever from the inboard end of the common end region in a direction away from the common end region toward the first end of the through-duct for a second distance which less than the first distance;

each of the plurality of second-holder resilient holding fingers formed with a holding portion located at a free end of the finger; and

the holding portion of each of the first-holder resilient holding fingers being completely longitudinally displaced from the holding portion of each of the second-holder resilient holding fingers.

6,015,963

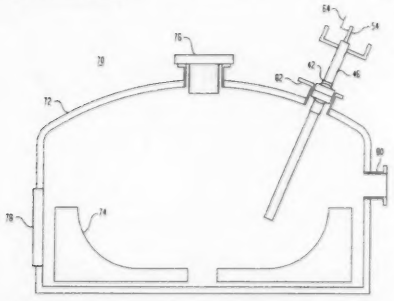
PLASMA ARC FURNACE WITH IMPROVED REPLACEABLE ELECTRODES

Philip A. Flannery, P.O. Box 128, Ramsey, Mont. 59478; Jason McClafferty, 2511 Amherst, and Donald A. Orne, 423 Hobson St., both of Butte, Mont. 59701

Filed Feb. 4, 1999, Appl. No. 244,150

Int. Cl.[7] B23K *9/00*

U.S. Cl. 219—121.52 **7 Claims**



1. A plasma arc furnace which comprises:

a containment vessel;

a plasma arc torch through which a cooling fluid flows;

the torch having a replaceable electrode constructed from a conductive refractory;

the electrode being isolated from contact with the cooling fluid;

the plasma arc torch having a portion thereof extending through a wall of the containment vessel and outside the vessel; and

the plasma arc torch being configured so that the electrode can be replaced by removal through the portion of the torch extending outside of the containment vessel without interruption of flow of cooling fluid through the torch.

6,015,964

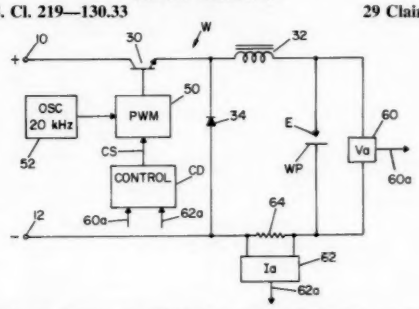
ELECTRIC ARC WELDER WITH CONTROLLED ARC

Ivan E. Baker, Concord, Ohio, assignor to Lincoln Global, Inc., Cleveland, Ohio

Filed Aug. 3, 1998, Appl. No. 126,790

Int. Cl.[7] B23K *9/09*

U.S. Cl. 219—130.33 **29 Claims**



1. In an electric arc welder for creating an electric arc with intermittent short circuit conditions for melting and depositing metal from an advancing welding wire onto a workpiece, said welder including a power supply having a switch operated by a pulse width modulator for creating a series of current pulses having a fixed frequency and a conduction width determined by the command voltage of a control signal driving said pulse width modulator, means for sensing the arc voltage, means for sensing the arc current, and an error amplifier for generating said command signal in accordance with the set point voltage on a set point input and the feedback voltage on a feedback input, the improvement comprising: first set point means for creating a fixed set point voltage, second set point means for creating a ramp set point voltage increasing at a selected rate from a starting voltage to create a voltage having a selected increasing slope during a short circuit condition, a toggle means having a first toggled condition for connecting said first set point means to said set point input of said error amplifier while disconnecting said second set point means from said set point input and a second toggled condition for connecting said second set point means to said set point input while disconnecting said first set point means from said set point input, means for creating a short signal when said wire shorts against said workpiece, means for toggling said toggle means from said first condition into said second condition in response to said short signal, and means for applying a voltage representative of said sensed voltage to said feedback input of said error amplifier when said toggle means is in said first toggled condition.

6,015,965

METHOD FOR HEATING A SOLID SURFACE SUCH AS A FLOOR, WALL, ROOF, OR COUNTERTOP SURFACE

Charles G. Miller, Branford, Conn.; John A. Rolls, Armonk, N.Y., and Otis H. Hastings, Mahwah, N.J., assignors to Thermion Systems International, Stratford, Conn.

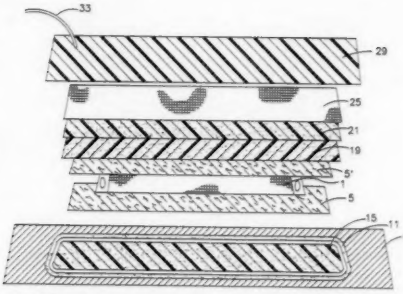
Division of application No. 08/633,965, Apr. 19, 1996. This application May 13, 1999, Appl. No. 311,219.

Int. Cl.[7] H05B *1/00*

U.S. Cl. 219—213 **4 Claims**

1. A method for heating a countertop surface, comprising;

providing a pre-formed panel heater element to the countertop surface, wherein said pre-formed panel heater element consists of an inner layer composed of a fabric of electrically conductive fibers encapsulated between two fiberglass/resin layers; two outer fiberglass/resin layers disposed on opposing surfaces of said inner layer and encapsulating said inner layer;



and electrical leads connected to said conductive fibers and adapted to receive power from a power source;

disposing the pre-formed panel heater element at a predetermined depth in the countertop surface; and

energizing the conductive fibers of the pre-formed panel heater element at prescribed intervals and temperatures which are effective to distribute heat evenly on the countertop surface.

6,015,966

CIRCUIT BOARD HEATING APPARATUS

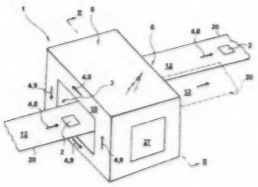
Johannes Rehm, Schelklingen, Germany, assignor to Rehm Anlagenbau GmbH & Co., Blaubeuren-Seissen, Germany

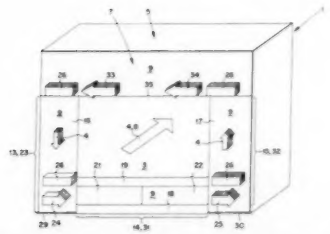
Filed Mar. 2, 1998, Appl. No. 32,795

Claims priority, application Germany, Mar. 13, 1997, 297 04 601 U

Int. Cl.[7] F27B *9/06*

U.S. Cl. 219—388 **34 Claims**





1. A heating apparatus (**1**) for heating circuit boards (**2**), comprising a feed portion (**3**) for feeding the circuit boards in a substantially horizontal direction, at least one heating portion (**5**) following in transportation direction (**4**) downstream of the feed portion, a discharge portion (**6**) for the discharge of circuit boards supplied from the heating portion in a substantially horizontal direction, and a transportation device (**7**) connecting feed portion (**3**), heating portion (**5**) and discharge portion (**6**), characterized in that a transportation path (**9**) of the transportation device (**7**) in the heating portion (**5**) extends in a plane (**10**) substantially in a direction transverse to the horizontal feed or discharge direction (**4**) and the transportation path (**9**) connects feed and discharge portions (**3**, **6**) in substantially ring-like configuration.

6,015,967

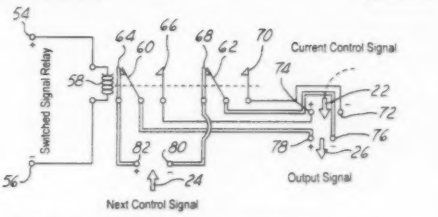
GROUND DRIFT-FREE SWITCHING CIRCUIT

Cheng-Woei Chuang, Hsin-Chu, and Kuen Lin Guan, Pu-Zi, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-chu, Taiwan

Filed May 5, 1998, Appl. No. 72,934

Int. Cl.[7] H05B *1/02*

U.S. Cl. 219—519 **2 Claims**



1. A temperature control system comprising:

means for sensing the temperature within an environment to be controlled and for producing a first signal related to the sensed temperature;

a temperature control circuit responsive to a signal of varying level for controlling the temperature in said environment,

calibration means for producing a second signal for calibrating said temperature control circuit; and

switching means for selectively coupling either of said sensing means and said calibration means with said temperature control circuit, whereby one of said first and second signals is delivered to said temperature control circuit, said switching means including:

(1) a first circuit coupled with said sensing means and including a first ground,

(2) a second circuit coupled with said calibration means and including a second ground, said first and second grounds being separate and isolated from each other, each of said first and second circuits having a residual level of electrical current therein, and

(3) switchable means for completing a circuit either between said sensing means and said temperature control circuit, or between said calibration means and said temperature control circuit, said switchable means including a relay and fist and second pairs of electrical contacts, respectively connected to said first and second circuits, each contact in said first pair thereof being coupled with a different one of said first and second grounds such that upon switching of said switchable means to complete a circuit between said temperature control circuit and one of said sensing means and said calibration mans the residual current in one of said first and second circuits does not alter the level of said signal of varying level delivered to said temperature control circuit.

6,015,968

MICROWAVE DISTILLATION APPARATUS, AND VESSEL-BIASING ASSEMBLY

Bernard Armstrong, 1716-2G Charleston Place Ln., Charlotte, N.C. 28212

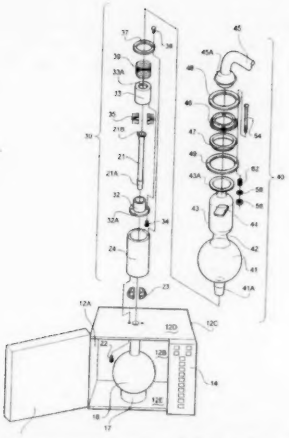
Division of application No. 08/542,463, Oct. 12, 1995, Pat. No. 5,711,857. This application Jan. 20, 1998, Appl. No. 8,984.

Int. Cl.[7] H05B *6/80*

U.S. Cl. 219—687 **2 Claims**

1. In combination with a vessel for being located within a microwave heating chamber, and having an open mouth for receiving a liquid, said combination comprising:

(a) a hollow connecting tube for extending through a wall of the heating chamber and having opposing first and second ends, the first end of said connecting tube defining an annular opening located outside of the heating chamber and the second end of said connecting tube being arranged in sealing engagement with the mouth of the vessel;



(b) a housing mounted outside of the heating chamber and surrounding the first end of said connecting tube, said housing including an inwardly-extending top flange and an inside shoulder vertically spaced apart from the top flange;

(c) a cylinder assembly movable within said housing and including a top ring and an outwardly-extending bottom flange, the top ring engaging an entire circumference of the annular opening formed at the first end of said connecting tube, and the bottom flange of the cylinder assembly contacting the inside shoulder of the housing to restrict movement of the cylinder assembly within said housing in a direction towards said vessel; and

(d) a coil spring located between and engaging the inwardly-extending top flange of the housing and the outwardly-extending bottom flange of the cylinder assembly, said spring normally urging the bottom flange of said cylinder assembly against the inside shoulder of the housing to thereby maintain the seal between the second end of said connecting tube and the mouth of the vessel.

6,015,969

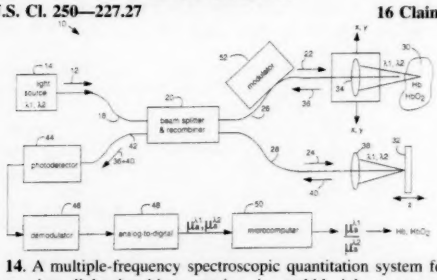
MULTIPLE-WAVELENGTH SPECTROSCOPIC QUANTITATION OF LIGHT-ABSORBING SPECIES IN SCATTERING MEDIA

Howard Nathel, Albany; Harry E. Cartland; Billy W. Colston, Jr., both of Livermore; Matthew J. Everett, Pleasanton, and Jeffery N. Roe, San Ramon, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of application No. 08/714,745, Sep. 16, 1996, abandoned. This application Jan. 16, 1998, Appl. No. 8,234.

Int. Cl.[7] **G01B** *9/02*

U.S. Cl. 250—227.27 **16 Claims**



14. A multiple-frequency spectroscopic quantitation system for measuring light-absorbing species in turbid inhomogeneous medium, the system comprising:

a near infrared light source for generating multiple different wavelengths of light such that one wavelength is selected not to be absorbed by a particular one of the individual targeted species and the other wavelength is selected to be strongly absorbed by said particular one of the individual targeted species, and directing both wavelengths of light into a light beam;

a beam splitter and recombiner for optically splitting said light beam into a sample beam and a reference beam;

a first single mode fiber for passing said sample beam through a sample comprising a turbid inhomogeneous medium that is host to a plurality of said individual targeted species;

a first lens for optically collecting said sample beam affected by said highly diffuse inhomogeneous medium into a reflected sample beam;

a second single mode fiber for reflecting said reference beam on a variable distance mirror with a highly reflective surface;

a second lens for optically collecting reflections of said reference beam from said mirror into a reflected reference beam;

means for optically mixing said affected sample beam and said reflected reference beam, wherein those photons in the reflected sample beam that are within a coherence length of having traveled the same distance in their respective pathlengths with those photons in the reflected reference beam provide for interference fringes for each of said multiple different wavelengths of light that have an amplitude proportional to the number of selected photons in the reflected sample beam;

a photodetector and demodulator for detecting and demodulating the amplitudes of said interference fringes for each of said multiple different wavelengths of light and providing an electric signal proportional to each of said interference fringe amplitudes; and

a microcomputer connected with an analog to digital converter to the photodetector and demodulator for ratioing said proportional electrical signals and relating a ratio derived therefrom to a concentration of said individual targeted species in said turbid inhomogeneous medium.

6,015,970

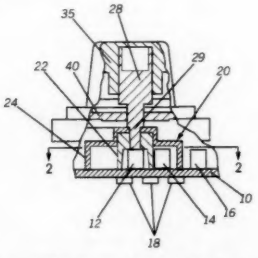
SWITCH ASSEMBLY INCORPORATING OPTICAL CONTROL FUNCTION

Andrew T. Guzik, Pompano Beach; David L. Ellis, Coconut Creek; Rudy Yorio, Pompano Beach; Steven D. Pratt, and Sivakumar Muthuswamy, both of Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 11, 1997, Appl. No. 988,922

Int. Cl.[7] **G01D** *5/34*

U.S. Cl. 250—229 **19 Claims**



1. A switch assembly for an electrical device, comprising:

a printed circuit substrate having a first major surface;

first and second light detectors mounted upon the first major surface of said printed circuit substrate;

a light source mounted upon the first major surface of said printed circuit substrate; and

a rotatable interposer mechanism having first and second concentric cylindrical walls, the walls having first and second respective diameters, the first wall being translucent to IR

light and having a light transmission control means for adjusting the intensity of light transmitted therethrough, the second wall being opaque and having an opening formed therethrough, wherein

light emitted from the light source is transmitted through the opening in the opaque second wall to the second light detector only when said electrical device is in an OFF mode, light emitted from the source is transmitted only to the first light detector when said electrical device is in an ON mode, and the intensity of light received by the first light detector is adjustable via said light transmission control means.

6,015,971

OPTICAL SENSING SYSTEM USING POSITIONING HOLES FOR ENCODING

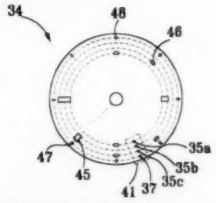
Shu-Ming Liu, Taipei, Taiwan, assignor to Primax Electonics, Ltd., Taiwan

Filed Dec. 3, 1997, Appl. No. 984,376

Claims priority, application Switzerland, Oct. 9, 1997, 86114883

Int. Cl.[7] G01D *5/34*

U.S. Cl. 250—231.13 **5 Claims**



1. An optical sensing system comprising:

an optical panel comprising a plurality of encoding holes and positioning holes;

a sensing device for detecting movements of the optical panel related to the sensing device, the sensing device comprising a light source for emitting light to the optical panel, a first light detector for detecting the light transmitted through the positioning holes and a second light detector for detecting the light transmitted through the encoding holes and generating an output to indicate the detected encoding holes accordingly; and

a control circuit connected to the sensing device for converting the output of the second light detector into an encoding signal when one of the positioning holes is detected by the first light detector;

wherein the relative positions of the positioning holes and the encoding holes over the optical panel are arranged according to the positions of the first and second light detectors and the size of each of the positioning holes is smaller than the size of each of the encoding holes, so that for each of the positioning holes detected by the first light detector, a predetermined number of corresponding encoding holes of the detected positioning hole are clearly detected in the same time by the second light detector.

6,015,972

BOUNDARY ACTIVATED DISSOCIATION IN ROD-TYPE MASS SPECTROMETER

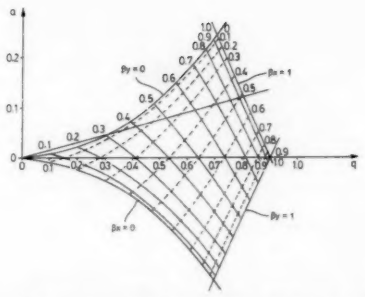
James W. Hager, Mississauga, Canada, assignor to MDS Inc., Etobicoke, Canada

Provisional application No. 60/071,231, Jan. 12, 1998. This application May 27, 1998, Appl. No. 84,778.

Int. Cl.[7] H01J *49/42*

U.S. Cl. 250—282 **9 Claims**

1. A method of operating a rod type mass spectrometer comprising: introducing precursor ions into said mass spectrometer, providing a collision gas therein to limit the mean free path of said



precursor ions, applying RF and resolving DC voltages to said mass spectrometer to operate said mass spectrometer near the $\beta = 0$ boundary for said precursor ions, thereby inducing boundary activated dissociation of at least some of said precursor ions to produce fragment ions, and detecting at least some of said fragment ions.

6,015,973

ENERGY FILTER

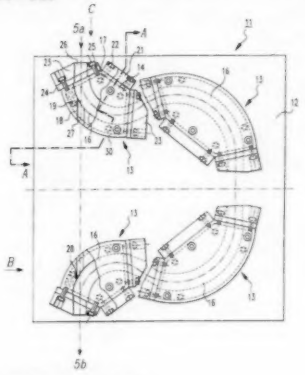
Hiromi Nunome, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Oct. 16, 1997, Appl. No. 951,247

Claims priority, application Japan, Oct. 16, 1996, 8-273422

Int. Cl.[7] H01J *49/44*

U.S. Cl. 250—305 **4 Claims**



1. An energy filter comprising:

a base plate;

a plurality of lenses mounted to said base plate, each lens comprised of two polepieces stacked on top of each other separated by two spacers and secured with screws; and

said spacers and polepieces defining a passage therebetween.

6,015,974

SCINTILLATION CAMERA WITH IMPROVED SCINTILLATION MATERIAL SEGMENT INTERFACES

Sebastian Genna, Belmont, Mass., assignor to Digital Scintigraphics, Inc., Waltham, Mass.

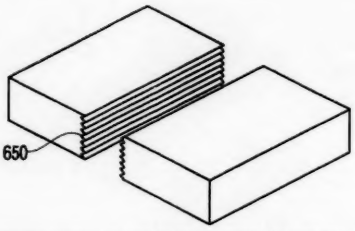
Continuation-in-part of application No. 08/543,870, Oct. 19, 1995, Pat. No. 5,652,429. This application Jul. 21, 1997, Appl. No. 897,714.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G01T *1/202*

U.S. Cl. 250—368 **16 Claims**

1. A scintillation camera comprising:



photosensor means for producing an output in response to emitted light;

a scintillation material for emitting light directed to said photosensors means in response to radiation absorbed by a source, the scintillation material formed in two or more segments defining an optical interface between adjacent segments; and

means for increasing the surface area at the interface for improving the transmissivity of the interface and efficiently optically coupling the adjacent segments.

6,015,975

METHOD AND APPARATUS FOR CHARGED PARTICLE BEAM EXPOSURE

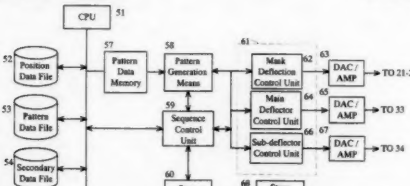
Kenichi Kawakami; Masahiko Susa; Kobayashi Katsuhiko; Akio Yamada; Koichi Yamashita, and Naoki Nishio, all of Tokyo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 23, 1997, Appl. No. 956,437

Claims priority, application Japan, Apr. 10, 1997, 9-092248

Int. Cl.[7] H01J *37/302*

U.S. Cl. 250—492.22 **21 Claims**



1. A method of charged particle beam exposure wherein an area of an exposure pattern is exposed by irradiating a sample with a charged particle beam while moving said sample

wherein secondary data, including at least density information of the exposure pattern and being in common for plural exposure apparatuses, is generated in advance from a pattern data including at least data of the exposure pattern and data of an exposure position, the exposure for each exposure apparatus comprising:

storing the secondary data in the exposure apparatus;

generating speed data including a speed distribution in a direction of movement of the sample in accordance with the secondary data and a characteristic of the exposure apparatus; and

irradiating the sample with the charged particle beam in accordance with the pattern data while being moved at variable speed in accordance with the speed data.

6,015,976

FABRICATION APPARATUS EMPLOYING ENERGY BEAM

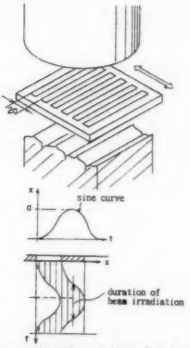
Masahiro Hatakeyama; Katsunori Ichiki, both of Fujisawa; Takao Kato; Yotaro Hatamura, 2-12-11 Kohinata, Bunkyo-ku, both of Tokyo, and Masayuki Nakao, Matsudo, all of Japan, assignors to Ebara Corporation, and Yotaro Hatamura, both of Tokyo, Japan

Division of application No. 08/617,376, Mar. 18, 1996, Pat. No. 5,868,952. This application Nov. 18, 1998, Appl. No. 195,254.

Claims priority, application Japan, Mar. 17, 1995, 7-86537; Mar. 17, 1995, 7-86538; Mar. 17, 1995, 7-86539; Mar. 17, 1995, 7-86543

Int. Cl.[7] H01J *37/302*

U.S. Cl. 250—492.23 **17 Claims**



1. An apparatus for performing micro-fabrication processing on a workpiece, said apparatus comprising:

an energy beam source for generating an energy beam along a beam axis;

a stage for holding a workpiece in a manner to adjust an orientation of the workpiece relative to said beam axis;

a mask member having a fine-structural pattern;

a mask holding device for holding said mask member at a position spaced from the workpiece held by said stage;

a relative positioning device for moving at least one component among said energy beam source, said mask member and the workpiece held by said stage relative to other of said components; and

a controller for controlling operation of said relative positioning device to ensure that said movement of said at least one component relative to said other components comprises continuous movement to produce a fine structure having a smooth curved or inclined surface on the workpiece.

6,015,977

INTEGRATED CIRCUIT MEMORY CELL HAVING A SMALL ACTIVE AREA AND METHOD OF FORMING SAME

Russell C. Zahorik, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jan. 28, 1997, Appl. No. 790,011

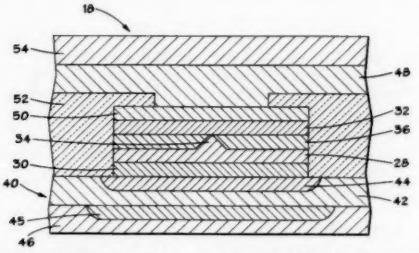
Int. Cl.[7] H01L *45/00*

U.S. Cl. 257—4 **14 Claims**

1. A memory cell comprising:

a first electrode;

a memory element comprised of chalcogenide material being electrically coupled to said first electrode, said memory element having a protruding contact portion, said protruding contact portion having a generally triangular cross-section and terminating in a tip; and



a second electrode, said second electrode being electrically coupled to said tip of said protruding contact portion of said memory element.

6,015,978

RESONANCE TUNNEL DEVICE

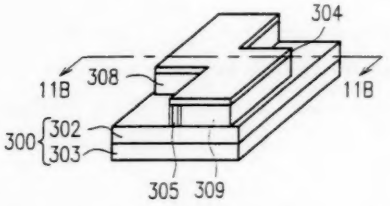
Koichiro Yuki, Neyagawa; Kiyoyuki Morita, Yawata; Kiyoshi Morimoto, Hirakata, and Yoshihiko Hirai, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of application No. 08/808,580, Feb. 28, 1997, Pat. No. 5,888,852. This application Oct. 20, 1998, Appl. No. 175,505.

Claims priority, application Japan, Mar. 1, 1996, 8-044492

Int. Cl.[7] **H01L** *29/06*

U.S. Cl. 257—25 **2 Claims**



1. A semiconductor device comprising:

a double barrier structure including a silicon thin plate having side walls and extending in a first direction, and a pair of first oxide films formed on the side walls of the silicon thin plate; and

a second oxide film formed to cover the silicon thin plate,

wherein the second oxide film has a first opening and a second opening, and

a shortest distance between the first opening and the second opening in a second direction vertical to the first direction and parallel to a surface of the second oxide film is substantially equal to a width of the silicon thin plate in the second direction.

6,015,979

NITRIDE-BASED SEMICONDUCTOR ELEMENT AND METHOD FOR MANUFACTURING THE SAME

Lisa Sugiura, Kawasaki; Masayuki Ishikawa, Yokohama; Shinya Nunoue, Ichikawa; Masaaki Onomura, and Masahiro Yamamoto, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1998, Appl. No. 143,560

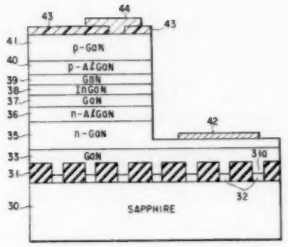
Claims priority, application Japan, Aug. 29, 1997, 9-234884; Mar. 3, 1998, 10-050773

Int. Cl.[7] **H01L** *27/15;31/12;31/153;33/00;23/58*

U.S. Cl. 257—86 **18 Claims**

1. A nitride-based semiconductor element comprising:

a first layer;



a mask formed on said first layer, said mask having a plurality of opening portions;

a nitride-based compound semiconductor layer formed on said mask, said nitride-based semiconductor layer including:

a first region which has threading dislocations produced in such a manner that, in approximately a middle portion between two adjacent opening portions of said plurality of opening portions in said mask, a plurality of dislocations extend vertically to a surface of said mask; and

a second region which comprises portions other than said middle portions and free from said dislocations; and

a desired element structure formed above said mask having said plurality of opening portions.

6,015,980

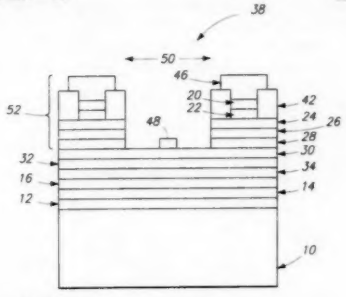
METAL LAYERED SEMICONDUCTOR LASER

John E. Bowers, and Daniel Abraham Tauber, both of Santa Barbara, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of application No. 08/612,687, Mar. 8, 1996. This application Mar. 28, 1997, Appl. No. 828,372.

Int. Cl.[7] **H01L** *33/00*

U.S. Cl. 257—99 **15 Claims**



1. A semiconductor laser, comprising:

a substrate;

a fusion layer coupled to the substrate; and

a laser structure, coupled to the fusion layer, wherein the laser structure comprises:

a first contact layer coupled to the fusion layer;

a first cladding layer coupled to the first contact layer;

an active layer coupled to the first cladding layer;

a second cladding layer coupled to the active layer;

a second contact layer coupled to the second cladding layer;

a metallization layer selectively coupled to the second contact layer and the fusion layer.

6,015,981

HETEROSTRUCTURE FIELD-EFFECT TRANSISTORS (HFETS') WITH HIGH MODULATION EFFECTIVITY

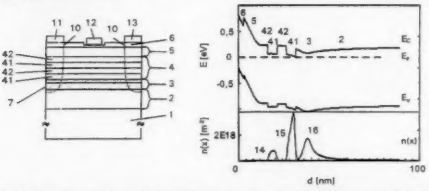
Markus Glück, Ehingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 27, 1998, Appl. No. 66,559

Claims priority, application Germany, Apr. 25, 1997, 197 17 500

Int. Cl.[7] H01L *29/778*

U.S. Cl. 257—194 **19 Claims**



1. A heterostructure field effect transistor with a high modulation effectivity, comprising: a semiconductor substrate; a semiconductor heterostructure layer sequence deposited on a surface of the semiconductor substrate and including a buffer layer formed on the surface of the substrate, a first supply layer formed on the surface of the buffer layer, a layer packet composed of a plurality of pairs of undoped layers of different semiconductor materials with each pair forming a respective heterojunction to provide at least two heterojunctions and at least two n-conducting channels (n-HFET) or p-conducting channels (p-HFET), a second supply layer formed on the layer packet, and an undoped cover layer formed on the second supply layer; first and second laterally spaced ohmic contacts on the surface of the cover layer; and a control electrode for the transistor disposed on the surface of the cover layer between the first and second ohmic contacts; and wherein the substrate is a high-ohmic silicon substrate with a specific resistance of at least 10^2 Ωcm.

6,015,982

LATERAL BIPOLAR FIELD EFFECT MODE HYBRID TRANSISTOR AND METHOD FOR OPERATING THE SAME

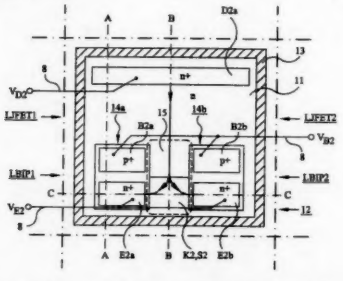
Anders Söderbärg, Uppsala, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 12, 1997, Appl. No. 968,213

Claims priority, application Sweden, Nov. 13, 1996, 9604142

Int. Cl.[7] H01L *29/772;27/085*

U.S. Cl. 257—262 **9 Claims**



1. A semiconductor device in an active layer with a high breakthrough voltage, said device having at least one depletion region with reduced field strength and comprising:

a component region of semiconductor material with an upper surface in the active layer, said component region having a relatively low concentration of dopant of a first type,

an electrically delimiting separation layer extending around the component regions towards the surrounding active layer,

in the component region recessed transistor regions for at least one semiconductor component,

at least three electrical connections in the component region,

wherein the device comprises at least two separated, in the component region recessed based regions with a relatively low concentration of dopant of a second type opposite to the first type of dopant, wherein the recessed base regions extend from said upper surface of the component region,

wherein the device comprises a PN-junction at each surface delimiting the recessed base regions from a remaining part of the component region,

wherein the device comprises at least one drain connection placed in said remaining part of the component region with a high concentration of dopant of the first type, said drain connection being connection with a first one of the electrical connections,

wherein each base region surrounds an emitter region which is heavily doped with the first type of dopant and which is connected to a second one of the electrical connections, and

wherein at least one base connection region is arranged in each base region, said base connection region being heavily doped with the second type of dopant and which is connected to a third one of the electrical connections,

wherein at least one common collector region extends between the PN-junctions of two adjacent base regions at the upper surface of the component region, said collector region at a predetermined difference in potential between the drain connection and the base connections being completely depleted at least in a lateral extension.

6,015,983

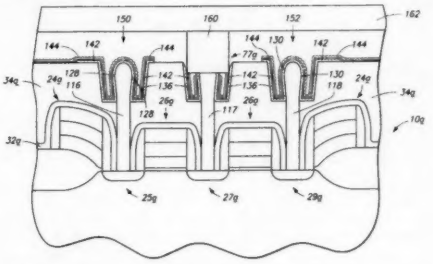
BITLINE CONTACT STRUCTURES AND DRAM ARRAY STRUCTURES

Kunal R. Parekh, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of application No. 08/798,251, Feb. 11, 1997. This application Jun. 8, 1998, Appl. No. 93,956.

Int. Cl.[7] H01L *27/108;29/76;29/94;31/119*

U.S. Cl. 257—296 **1 Claim**



1. A DRAM array comprising:

a first node location, a second node location and a third node location; the second node location being electrically coupled to the first node location through a first transistor gate and being electrically coupled to the third node location through a second transistor gate;

a first electrically conductive pedestal in electrical connection with the first node location, a second electrically conductive pedestal in electrical connection with the second node location, and a third electrically conductive pedestal in electrical connection with the third node location;

a storage node layer against a lateral surface of the first pedestal, a lateral surface of the second pedestal, and a lateral surface of the third pedestal;

a dielectric layer and a cell layer laterally against the storage node layer and laterally adjacent the first, second and third pedestals; the dielectric layer, cell layer and storage node layer forming a first capacitor electrically connected to the

first node location through the first pedestal, and forming a second capacitor electrically connected to the third node location through the third pedestal;

an electrically conductive bitline plug physically contacting the second pedestal, the bitline plug also physically contacting the storage node layer, cell layer and dielectric layer;

a bitline over the first and second capacitors and electrically connected to the second pedestal through the bitline plug;

the second pedestal and first capacitor together forming a first DRAM cell electrically connected to the bitline; and

the second pedestal and second capacitor together forming a second DRAM cell electrically connected to the bitline.

6,015,984

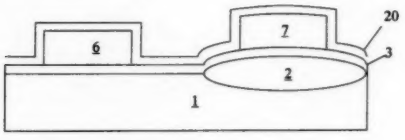
CAPACITOR WITH OXIDE/NITRIDE/OXIDE COMPOSITE DIELECTRIC SUITABLE FOR EMBEDDED NONVOLATILE MEMORY IN ANALOG APPLICATIONS

Len-Yi Leu, Hsinchu, Taiwan, assignor to Winbond Electronics Corp., Hsinchu, Taiwan

Filed Sep. 18, 1998, Appl. No. 156,582

Int. Cl.[7] **H01L** *21/336;21/8242*

U.S. Cl. 257—298 **6 Claims**



1. A process for making embedded memory cells comprising the steps of:

(a) forming a tunnel oxide layer on a substrate having a field oxide layer;

(b) forming a first polysilicon (poly**1**) layer on said substrate covering said tunnel oxide layer;

(c) forming a first poly**1** photoresist on said poly**1** layer, wherein said first poly**1** photoresist is patterned to form a floating gate in a memory region of said poly**1** layer and a bottom electrode in a capacitor region of said poly**1** layer;

(d) performing a first poly**1** etch using said first poly**1** photoresist so as to form said floating gate and said bottom electrode;

(e) forming a second poly**1** photoresist on said poly**1** layer, wherein said second poly**1** photoresist is patterned to reveal only said bottom electrode;

(f) using said second poly**1** photoresist to perform addition implantation in said bottom electrode;

(g) forming an Oxide/Nitride/Oxide (ONO) layer on said substrate;

(h) forming a second polysilicon (poly**2**) layer on said substrate covering said ONO layer;

(i) forming a first poly**2** photoresist on said poly**2** layer, wherein said first poly**2** photoresist is patterned to define a control gate in a memory region of said poly**2** layer while covering at least said capacitor region of said poly**2** layer;

(j) using said first poly**2** photoresist to perform a first poly**2** etch to form said control gate, and removing said first poly**2** photoresist;

(k) forming a second poly**2** photoresist on said poly**2** layer, wherein said second poly**1** photoresist is patterned to reveal only said top electrode;

(l) using said second poly**2** photoresist to perform a second poly**2** etch and form said top electrode;

(m) using said second poly**2** photoresist to perform an ONO etch;

(n) removing said poly**2** photoresist and cleaning.

6,015,985

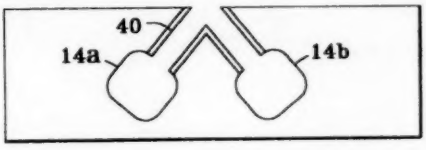
DEEP TRENCH WITH ENHANCED SIDEWALL SURFACE AREA

Herbert Lei Ho, New Windsor; David Edward Kotecki, Hopewell Junction, and Carl John Radens, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/784,558, Jan. 21, 1997, Pat. No. 5,849,638. This application Jun. 17, 1997, Appl. No. 877,446.

Int. Cl.[7] **H01L** *27/108;29/76;29/94;31/119*

U.S. Cl. 257—301 **15 Claims**



1. An integrated circuit comprising:

a first titled trench; and

a second tilted trench intersecting the first tilted trench, wherein the first tilted trench and the second tilted trench are closed.

6,015,986

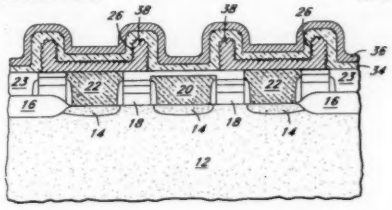
RUGGED METAL ELECTRODES FOR METAL-INSULATOR-METAL CAPACITORS

Klaus F. Schuegraf, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/576,952, Dec. 22, 1995, abandoned. This application Oct. 6, 1997, Appl. No. 943,222.

Int. Cl.[7] **H01L** *21/265*

U.S. Cl. 257—303 **16 Claims**



1. A DRAM capacitor comprising:

an electrode formed of a substantially pure metal layer directly over and contacting a surface of a conductive silicon structure, the metal layer having a hemispherical surface morphology different from the surface morphology of said underlying surface of said conductive silicon structure;

a dielectric layer directly over and contacting the metal layer; and

a conductive layer directly over and contacting the dielectric layer.

6,015,987

SEMICONDUCTOR DEVICE HAVING CAPACITOR EXHIBITING IMPROVED MOSITURE RESISTANCE AND MANUFACTURING METHOD THEREOF

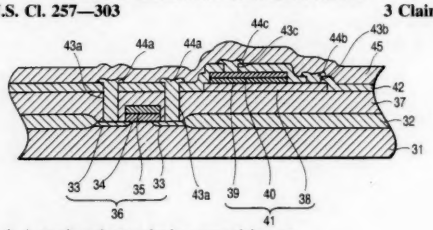
Koji Arita, Osaka; Eiji Fujii, Ibaraki; Yasuhiro Shimada, Mishima-gun; Yasuhiro Uemoto, Otsu; Toru Nasu, Kyoto; Akihiro Matsuda, Suita; Yoshihisa Nagano, Suita; Atsuo Inoue, Otokuni-gun; Taketoshi Matsuura, Takatsuki, and Tatsuo Otsuki, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of application No. 08/844,108, Apr. 28, 1997, Pat. No. 5,780,351, which is a division of application No. 08/284,984, Aug. 4, 1994, Pat. No. 5,624,864. This application May 4, 1998, Appl. No. 71,122.

Claims priority, application Japan, Aug. 5, 1993, 5-194617; Aug. 5, 1993, 5-194618; Feb. 24, 1994, 6-026514; Mar. 25, 1994, 6-055552

Int. Cl.[7] **H01L** *27/108;29/76;29/94;29/00*

U.S. Cl. 257—303 **3 Claims**



1. A semiconductor device comprising an

integrated circuit and a capacitor formed on the integrated circuit,

said capacitor comprising a bottom electrode composed of a conductive layer formed on an insulating layer of the integrated circuit, a capacitor dielectric layer including a ferroelectric layer formed on the bottom electrode, and a top electrode composed of a conductive layer formed on the capacitor dielectric layer,

the top electrode and bottom electrode of the capacitor are connected with interconnections of the integrated circuit through contact holes provided in an interlayer insulating layer formed so as to cover the capacitor, a passivation layer is formed so as to cover the interconnections, and

the moisture content of the interlayer insulating layer of 0.5 or less per 1 cm^3.

6,015,988

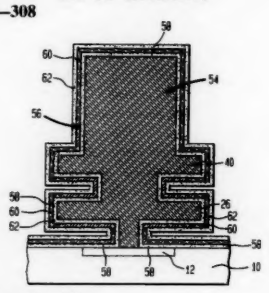
MICROSTRUCTURE AND METHODS FOR FABRICATING SUCH STRUCTURE

Dirk Tobben, Fishkill, N.Y., and Peter Weigand, Unterhaching, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of application No. 08/829,255, Mar. 31, 1997. This application Nov. 20, 1998, Appl. No. 197,391.

Int. Cl.[7] **H01L** *29/72*

U.S. Cl. 257—308 **9 Claims**



1. A structure comprising:

(A) a substrate;

(B) a dielectric support structure disposed on, and extending vertically from, a surface of the substrate;

(C) a capacitor disposed on surface portions of the vertically extending support structure such capacitor comprising:

(i) a first conductive layer disposed over a surface of the dielectric support structure, a portion of such first conductive layer being making electrical contact with the substrate;

(ii) a dielectric layer disposed over the conductive layer, such dielectric layer providing a dielectric for the capacitor; and

(iii) a second conductive layer disposed over the dielectric layer, such second conductive layer providing another electrode of the capacitor.

6,015,989

SEMICONDUCTOR DEVICE HAVING A CAPACITOR ELECTRODE FORMED OF IRIDUM OR RUTHENIUM AND A QUANTITY OF OXYGEN

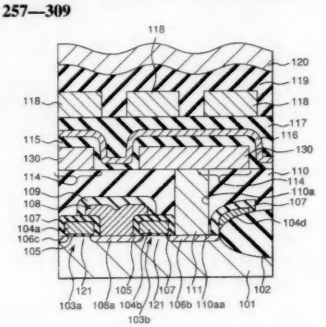
Tsuyosi Horikawa; Tetsuro Makita; Takeharu Kuroiwa; Noboru Mikami, and Teruo Shibano, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1996, Appl. No. 770,510

Claims priority, application Japan, Jun. 28, 1996, P 8-169761

Int. Cl.[7] **H01L** *27/108;29/76;29/94;31/119*

U.S. Cl. 257—309 **6 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a major surface;

a first interlayer insulating film formed on said semiconductor substrate and having an opening defined therein which reaches the major surface of said semiconductor substrate;

a connecting member made of Si as a principal component and embedded in the opening of said first interlayer insulating film;

a lower capacitor electrode connected electrically with the major surface of said semiconductor substrate through said connecting member and made of a principal component selected from the group consisting of ruthenium and iridium, said lower capacitor electrode containing at least one of oxygen in a quantity of 0.001 to 0.1% by atom and at least one impurity element in a quantity of 0.1 to 5% by atom, said impurity element being selected from the group consisting of titanium, chrome, tungsten, cobalt, palladium and molybdenum;

a capacitor dielectric film formed on said lower capacitor electrode;

an upper capacitor electrode formed on said capacitor dielectric film; and

a second interlayer insulating film formed on said upper capacitor electrode.

6,015,990

SEMICONDUCTOR MEMORY DEVICE AND METHOD OF MANUFACTURING THE SAME

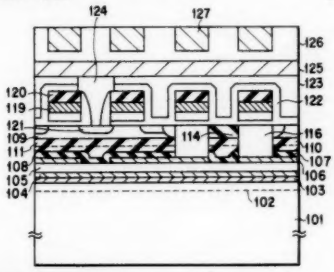
Katsuhiko Hieda, Yokohama; Tsunetoshi Arikado, Tokyo, and Katsuya Okumura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 26, 1998, Appl. No. 30,809

Claims priority, application Japan, Feb. 27, 1997, 9-044009; Feb. 25, 1998, 10-043657

Int. Cl.[7] **H01L** *27/108;29/94*

U.S. Cl. 257—310 **14 Claims**



1. A semiconductor element comprising:

a semiconductor section carrying a transistor formed therein; and

a capacitor section having a capacitor,

wherein the capacitor includes epitaxially grown first and second electrodes, and an epitaxially grown dielectric film is arranged between the first and second electrodes,

also wherein the transistor and the capacitor form a memory cell, a first electrode and a second electrode are sequentially stacked above a monocrystalline substrate to produce a multilayer structure, the transistor is formed on the capacitor with an insulation layer interposed therebetween, and either a source or a drain of the transistor is connected to the second electrode by way of a contact hole formed through the insulation layer,

further wherein the first electrode is made of an electroconductive material having a crystal structure with a tetragonal system type (100)-plane and the dielectric film has a tetragonal system type perovskite crystal structure.

6,015,991

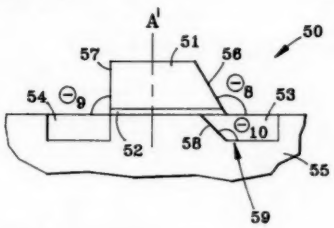
ASYMMETRICAL FIELD EFFECT TRANSISTOR

Donald C. Wheeler, Beacon, N.Y.; Jeffrey P. Gambino, Gaylordsville, Conn.; Louis L. Hsu, Fishkill, N.Y.; Jack A. Mandelman, Stormville, N.Y., and Rebecca D. Mih, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1997, Appl. No. 820,401

Int. Cl.[7] **H01L** *29/02*

U.S. Cl. 257—336 **20 Claims**



1. A field effect transistor comprising:

a first region serving as a source;

a second region serving as a drain, said first region and said second region both being formed in a substrate;

a thin gate oxide; and

a gate electrode,

said gate electrode being asymmetric, having a substantially vertical sidewall at an angle Θ9 with respect to the substrate and a sloped sidewall sloped at an angle Θ8 with respect to the substrate, Θ8 and Θ9 being unequal,

said second region extending underneath said sloped sidewall, wherein part of said second region which extends underneath said gate electrode is more lightly doped than the remaining part of said second region, and wherein

said second region has a sloped junction edge with an angle Θ10 underneath said gate electrode.

6,015,992

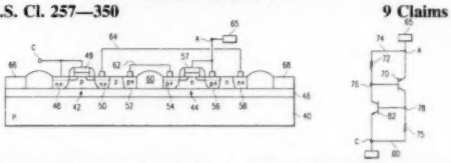
BISTABLE SCR-LIKE SWITCH FOR ESD PROTECTION OF SILICON-ON-INSULATOR INTEGRATED CIRCUITS

Amitava Chatterjee, and Ekanayake Amerasekera, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/034,680, Jan. 3, 1997. This application Dec. 30, 1997, Appl. No. 1,058.

Int. Cl.[7] **H01L** *29/74*

U.S. Cl. 257—350 **9 Claims**



1. An ESD protection device for protecting an active circuit fabricated in an SOI integrated circuit, which active circuit is connected to an ESD susceptible terminal, comprising:

a first region of a first conductivity type;

a second region of a second conductivity type opposite to said first conductivity type;

an isolation structure for electrically isolating said first and second regions;

a first bipolar transistor formed in said first region with a base of said first conductivity type;

a second bipolar transistor formed in said second region with a base of said second conductivity type;

a first contact of the first conductivity type material formed in said first region to allow the base of said first bipolar transistor to be connected external to said first region;

a second contact region of the second conductivity type formed in said second region to allow the base of said second bipolar transistor to be connected external to said second region; and

an interconnect structure external to said first and second regions for interconnecting said first and second bipolar transistors to external resistors in an SCR-like configuration.

6,015,993

SEMICONDUCTOR DIODE WITH DEPLETED POLYSILICON GATE STRUCTURE AND METHOD

Steven H. Voldman, South Burlington; Robert J. Gauthier, Jr., Hinesburg, and Jeffrey S. Brown, Middlesex, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1998, Appl. No. 144,386

Int. Cl.[7] **H01L** *23/62;29/76;29/00*

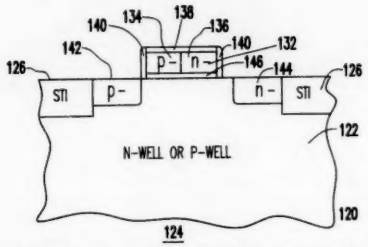
U.S. Cl. 257—355 **15 Claims**

1. A semiconductor chip comprising:

a semiconductor layer including a first conduction region of a first conduction type and a second conduction region of a second conductivity type;

a dielectric layer on said semiconductor layer; and

a conducting layer on said dielectric layer between said first conduction region and said second conduction region, said



conducting layer having a first region of a first conductivity type and a second region of a second conductivity type, said first region being electrically shorted to said second region, said first region being adjacent to said first conduction region and said second region being adjacent to said second conduction region, wherein at least one of said first and second conduction regions and said conducting layer is lightly doped or counter-doped such that a thickness of a depletion region in a respective one of said semiconductor layer and said conducting layer adjacent said dielectric layer increases in thickness with increasing electrical stress.

6,015,994

SEMICONDUCTOR MEMORY DEVICE AND MANUFACTURING METHOD THEREOF

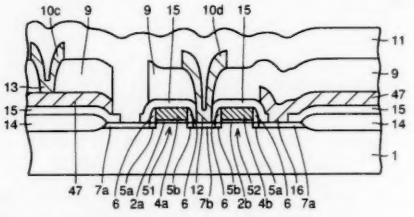
Mitsuyoshi Nakamura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1995, Appl. No. 417,333

Claims priority, application Japan, Apr. 6, 1994, 6-068725

Int. Cl.[7] H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—380 **11 Claims**



1. A semiconductor memory device in which a single memory cell consists of a single field effect transistor, wherein

said field effect transistor has its source terminal connected to a source wiring having at a portion thereof a resistor with a high resistance.

6,015,995

ROM DIODE STRUCTURE

Kuang-Yeh Chang, Taipei, Taiwan, assignor to United Microelectronics Corp., Taiwan

Division of application No. 08/808,258, Feb. 28, 1997, Pat. No. 5,891,777. This application Feb. 27, 1998, Appl. No. 31,818.

Claims priority, application Taiwan, Nov. 22, 1996, 85114443

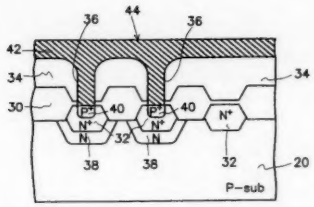
Int. Cl.[7] H01L *29/76;29/861*

U.S. Cl. 257—390 **5 Claims**

1. A read only memory device, comprising:

a P-type substrate;

a plurality of essentially parallel N-pole regions located on the substrate, said N-pole regions extending in a first direction, and being separated from each other by a space, said N-pole regions forming bit lines;



a plurality of N-type diffusion regions located in the substrate, each underlying a respective selected N-pole region so that each respective selected N-pole region is completely isolated from the substrate by the respective underlying N-type diffusion region to prevent current leakage;

a plurality of P-type diffusion regions, each being located within a respective one of the selected N-pole regions so that each P-type diffusion region is surrounded by the respective one of the selected N-pole regions to isolate the P-type diffusion region from the respective underlying N-type diffusion region, each respective P-type diffusion region and each respective selected N-pole region together forming one of a plurality of diodes;

a field oxide region disposed between adjacent ones of the diodes to separate the diodes from each other; and

a plurality of essentially parallel word lines extending in a second direction, each of said word lines being coupled to the respective P-type diffusion region.

6,015,996

CELL STRUCTURE OF AN IMPROVED CMOS STATIC RAM AND ITS FABRICATION METHOD

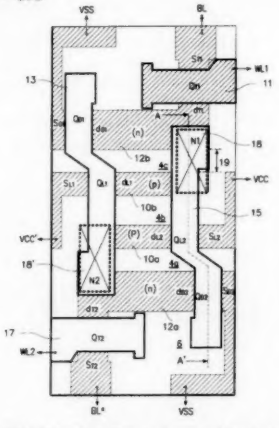
Chan-Jo Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 5, 1997, Appl. No. 906,433

Claims priority, application Rep. of Korea, Aug. 5, 1996, 96-32651; Jul. 12, 1997, 97-32492

Int. Cl.[7] H01L *29/76;29/94;23/48;27/11*

U.S. Cl. 257—393 **5 Claims**



1. A static RAM, having first and second load transistors, first and second driver transistors, and first and second switching transistors in a memory cell, the static RAM comprising:

a laminated structure forming the gate regions of the second load transistor and the second driver transistor, the laminated structure comprising a first polysilicon layer, a first portion of a silicide layer, and a first portion of a second polysilicon layer; and

an interconnection layer connecting the drain regions of the first load transistor and the first driver transistor, the interconnection layer comprising a second portion of the second polysilicon layer and a second portion of the silicide layer.

6,015,997

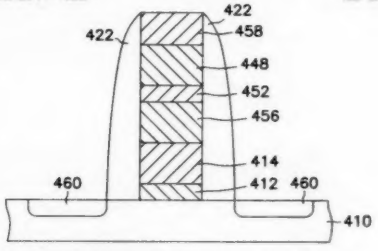
SEMICONDUCTOR STRUCTURE HAVING A DOPED CONDUCTIVE LAYER

Yongjun Hu; Pai-Hung Pan; Er-Xuan Ping; Randhir P.S. Thakur, and Scott DeBoer, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 19, 1997, Appl. No. 803,174

Int. Cl.[7] H01L *29/76;29/74;31/062;31/113*

U.S. Cl. 257—412 **22 Claims**



10. A semiconductor transistor structure, comprising:

a first semiconductor layer;

a gate oxide layer coupled to the first semiconductor layer;

an amorphous silicon semiconductor layer coupled to the gate oxide layer;

a nitride layer having a thickness of a few atomic layers coupled to the second semiconductor layer; and

a conductor layer, coupled to the nitride layer.

6,015,998

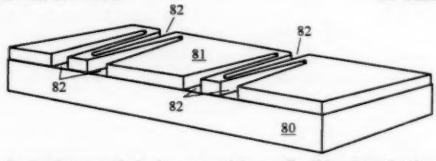
FLEXIBILITY CONTROL IN OPTICAL MATERIALS

Ernest Eisenhardt Bergmann, Borough of Fountain Hill, Pa., and Gustav Edward Derkits, Jr., New Providence, N.J., assignors to Lucent Technolgies, Inc., Murray Hill, N.J.

Filed Dec. 17, 1997, Appl. No. 992,638

Int. Cl.[7] H01L *31/0232;31/00*

U.S. Cl. 257—446 **30 Claims**



1. An integrated device comprising a flexible sheet having a plurality of electro-optical elements spaced apart thereon, comprising:

a sheet comprising substantially rigid material having the electro-optical elements thereon;

a plurality of flexible zones located adjacent to the electro-optical elements, each flexible zone comprising a plurality of trenches cutting at least partially through the sheet and the strips of material between the trenches;

such that the flexible zones create a plurality of substantially rigid islands having the electro-optical elements thereon, the islands being movable relative to each other.

6,015,999

LOW-VOLTAGE PUNCH-THROUGH TRANSIENT SUPPRESSOR EMPLOYING A DUAL-BASE STRUCTURE

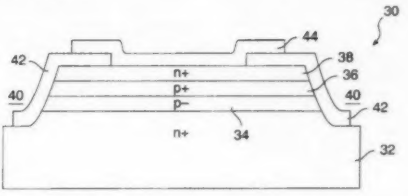
Bin Yu, Albany; Chenming Hu, Alamo; Ya-Chin King, Berkley; Jeffrey T. Pohlman, Camarillo, all of Calif., and Rita Trivedi, Corpus Christi, Tex., assignors to Semtech Corporation, Newbury Park, Calif.

Continuation of application No. 08/497,079, Jun. 30, 1995. This application Mar. 16, 1998, Appl. No. 39,926.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01L *29/00*

U.S. Cl. 257—497 **11 Claims**



1. A punch-through diode transient suppression device comprising:

a first region comprising an n+ region;

a second region comprising a p− region abutting said first region;

a third region comprising a p+ region abutting said second region;

a fourth region comprising an n+ region abutting said third region;

a passivation layer disposed over an upper surface of said fourth region; and

an isolation trench disposed at outer edges of said p− region, said p+ region, and said fourth n+ region, said isolation trench extending into said first n+ region.

6,016,000

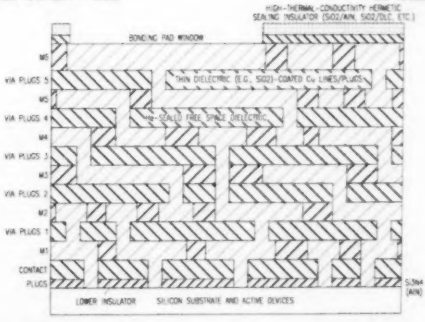
ULTRA HIGH-SPEED CHIP SEMICONDUCTOR INTEGRATED CIRCUIT INTERCONNECT STRUCTURE AND FABRICATION METHOD USING FREE-SPACE DIELECTRICS

Mehrdad M. Moslehi, Los Altos, Calif., assignor to CVC, Inc., Rochester, N.Y.

Filed Apr. 22, 1998, Appl. No. 64,431

Int. Cl.[7] H01L *29/00*

U.S. Cl. 257—522 **35 Claims**



1. A multi-level interconnect structure for a semiconductor integrated circuit chip on a semiconductor substrate comprising:

a plurality of electrically conductive metallization levels, each of said metallization levels comprising a plurality of electrically conductive interconnect segments;

a plurality of electrically conductive plugs for electrically connecting between various metallization levels and between said metallization levels and a plurality of semiconductor devices;

a free-space medium occupying at least a substantial portion of the electrically insulating regions within said multi-level interconnect structure; and

an electrically insulating top passivation overlayer for hermetic sealing of said multi-level interconnect structure and for protection of said integrated circuit chip, said top passivation overlayer also serving as a heat transfer medium for facilitating heat removal from said interconnect structure and providing additional mechanical support for said interconnect structure through contact with the top metallization level of said multi-level interconnect structure.

6,016,001

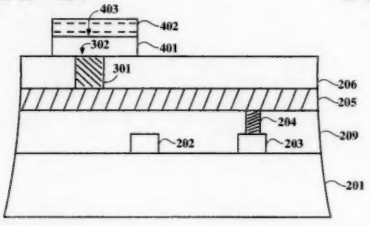
METAL TO AMORPHOUS SILICON TO METAL ANTI-FUSE STRUCTURE

Ivan Sanchez; Danny Echtle, and Landon B. Vines, all of San Antonio, Tex., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 19, 1997, Appl. No. 878,707

Int. Cl.[7] H01L *29/94*

U.S. Cl. 257—530 **11 Claims**



1. A strapless anti-fuse structure formed over a semiconductor substrate having semiconductor devices formed therein, said strapless anti-fuse structure comprising:

a metal layer formed over said semiconductor substrate, said metal layer electrically coupled to said semiconductor devices;

a dielectric layer deposited over said metal layer such that said dielectric layer overlies said metal layer;

an unetched plug disposed within an opening in said dielectric layer, said unetched plug electrically coupled to said metal layer;

an amorphous silicon block disposed over said unetched plug such that said amorphous silicon block is electrically connected to said unetched plug, said amorphous silicon block having a height, said height defining a threshold voltage for the engagement of said strapless antifuse structure; and

an interconnect disposed over said amorphous silicon block such that said interconnect is electrically connected to said amorphous silicon block such that, upon the application of current and a voltage greater than the threshold voltage of said strapless antifuse structure to said first metal layer, said metal in said unetched plug migrates so as to generate an electrical contact between said metal layer and said interconnect, said strapless anti-fuse structure not having an etched metal strap portion.

6,016,002

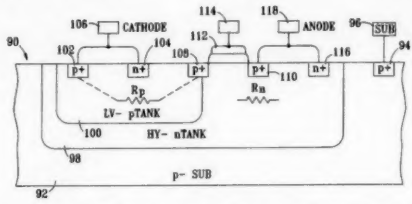
STACKED SILICON-CONTROLLED RECTIFIER HAVING A LOW VOLTAGE TRIGGER AND ADJUSTABLE HOLDING VOLTAGE FOR ESD PROTECTION

Julian Zhiliang Chen, Dallas; Thomas A. Vrotsos, Richardson, and Wayne T. Chen, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/033,542, Dec. 20, 1996. This application Dec. 18, 1997, Appl. No. 993,820.

Int. Cl.[7] H01L *23/62;29/00;29/74;31/111*

U.S. Cl. 257—546 **6 Claims**



1. A protective circuit for preventing excessive voltages from being applied through a signal line to a protected circuit, the protective circuit comprising:

an anode connected to the signal line;

a cathode connected to a ground reference;

a P-channel transistor having the source thereof connected to said anode and the gate thereof connected to a trigger voltage separate from the voltage on the signal line;

a PNP transistor having a base, an emitter connected to both said anode line and the source of said P-channel transistor, and further having a collector connected to the drain of said P-channel transistor;

an NPN transistor having the emitter thereof connected to said cathode, the base thereof connected to the collector of said PNP transistor and the drain of said P-channel transistor, and the collector thereof connected to the base of said PNP transistor;

a first resistor connected between said anode and the base of said PNP transistor and the collector of said NPN transistor;

a second resistor connected between said cathode and the collector of said PNP transistor, the drain of said P-channel transistor and the base of said NPN transistor, with said PNP and NPN transistor and said first and second resistors configured as a first SCR;

wherein said P-channel transistor will conduct current through said second resistor to cause the voltage on the base of said NPN transistor to increase thus turning on said NPN transistor and pulling the base of said PNP transistor low to turn on said PNP transistor and latch said first SCR; and

a second SCR connected in series with said first SCR, said first and second SCRs having a holding voltage associated therewith, such that a combined holding voltage of said protective circuit is approximately equal to the sum of the holding voltages of each of said first and second SCRs.

6,016,003

CHIP-LEAD INTERCONNECTION STRUCTURE IN A SEMICONDUCTOR DEVICE

Hideaki Uemura, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

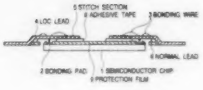
Filed Oct. 29, 1997, Appl. No. 960,217

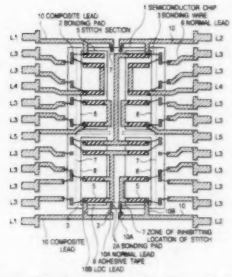
Claims priority, application Japan, Oct. 29, 1996, 8-286565

Int. Cl.[7] H01L *23/495*

U.S. Cl. 257—666 **8 Claims**

1. A semiconductor device comprising:





a semiconductor chip having a plurality of first bonding pads and a plurality of second bonding pads formed at a peripheral portion thereof;

a plurality of first leads extending toward said semiconductor chip but terminating before an edge of said semiconductor chip, said plurality of first leads being electrically connected to said plurality of first bonding pads through bonding wires; and

a plurality of second leads extending to and over said semiconductor chip, each of said plurality of second leads having at least one stitch section which is insulatively fixed to said semiconductor chip and which is electrically connected to a corresponding one of said plurality of second bonding pads through a bonding wire;

wherein at least one of said second leads has a plurality of stitch sections which are insulatively fixed to said semiconductor chip and which are electrically connected to different ones of said plurality of second bonding pads through different bonding wires, respectively; and

wherein at least one of said second leads is branched to have a first inner end which terminates before said edge of said semiconductor chip and which is electrically connected to a corresponding one of said plurality of second bonding pads through a bonding wire, and a second inner end which extends to and over said semiconductor chip and which has at least one stitch section insulatively fixed to said semiconductor chip and electrically connected to another corresponding one of said plurality of second bonding pads through a bonding wire.

6,016,004

METHOD AND APPARATUS FOR EPOXY LOC DIE ATTACHMENT

Ed A. Schrock, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of application No. 08/907,330, Aug. 6, 1997. This application Mar. 5, 1998, Appl. No. 35,320.

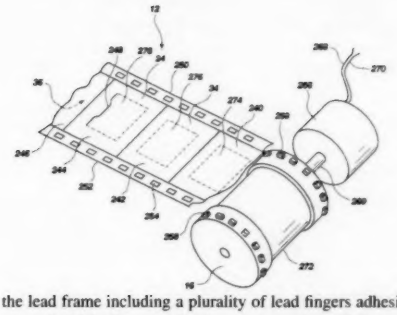
Int. Cl.[7] **H01L** *23/495*

U.S. Cl. 257—676 **14 Claims**

1. A semiconductor device assembly having a semiconductor device secured to a portion of a lead frame having a plurality of lead fingers, comprising:

a semiconductor device having an active surface having at least one bond pad thereon;

a lead frame having a portion thereof having an attaching surface for attaching the portion of the lead frame to a portion of the active surface of semiconductor device, the portion of



the lead frame including a plurality of lead fingers adhesively secured solely by an adhesive to a portion of the active surface of the semiconductor device; and

a quick curing adhesive attaching the portion of the lead frame to the portion of the active surface of the semiconductor device.

6,016,005

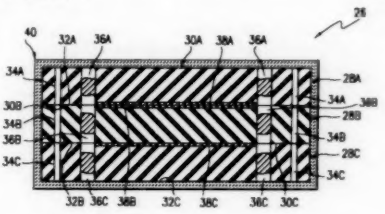
MULTILAYER, HIGH DENSITY MICRO CIRCUIT MODULE AND METHOD OF MANUFACTURING SAME

Mario J. Cellarosi, 14709 Plainfield Rd., Germantown, Md. 20874

Filed Feb. 9, 1998, Appl. No. 21,050

Int. Cl.[7] **H01L** *23/06;23/10;23/15*

U.S. Cl. 257—703 **7 Claims**



1. A multilayer circuit assembly, comprising:

a number of sintered sheets formed of a dielectric material, each of said sintered sheets having opposed major surfaces and a periphery, said each of said sintered sheets being formed with a selected density of registration holes and via;

a number of electrically conductive patterns each deposited onto a major surface of one of said sintered sheets;

said sintered sheets being vertically stacked on top of one another to form a stack, said via within said sintered sheets being filled with an electrically conductive material and at least some of said via in said each sintered sheet being positioned in electrical contact with said electrically conductive patterns deposited on adjacent sintered sheets within said stack of sintered sheets, said stack having an exterior surface defined by a first major surface of the uppermost sintered sheet in said stack, a second major surface of the lowermost sintered sheet in said stack and the combined peripheries of said individual sintered sheets extending between said first and second major surfaces;

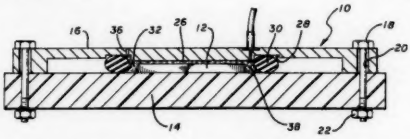
a sealing material applied to said exterior surface of said stack to substantially isolate said electrically conductive patterns from contamination.

6,016,006

THERMAL GREASE INSERTION AND RETENTION

Frank Kolman, Phoenix, and Michael Brownell, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of application No. 08/671,794, Jun. 24, 1996, abandoned. This application May 5, 1997, Appl. No. 850,440.
Int. Cl.[7] H01L *23/42*
U.S. Cl. 257—712 3 Claims



1. A method for applying a thermal grease to an integrated circuit, comprising the steps of:

a) placing an integrated circuit onto a substrate;

b) placing a seal onto said substrate around said integrated circuit;

c) enclosing said integrated circuit with a cover plate such that said integrated circuit, said plate and said seal define a thermal area; and,

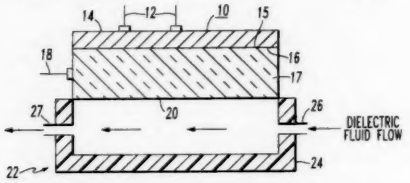
d) injecting a thermal grease into said thermal cavity through an inlet port of said cover plate so that said thermal grease is in contact with said integrated circuit, said cover plate and said seal.

6,016,007

POWER ELECTRONICS COOLING APPARATUS

Philip Albert Sanger, Monroeville, Pa.; Frank A. Lindberg, Baltimore, and Walter Garcen, Glen Burnie, both of Md., assignors to Northrop Grumman Corp., Los Angeles, Calif.

Filed Oct. 16, 1998, Appl. No. 206,242
Int. Cl.[7] H01L *23/34*
U.S. Cl. 257—714 25 Claims



1. A cooling arrangement for cooling a semiconductor circuit, comprising:

(A) a semiconductor having a predetermined CTE;

(B) a carrier having first and second sides, and having a predetermined CTE;

(C) said semiconductor being mounted on, and affixed to said first side of said carrier;

(D) said carrier being both thermally and electrically conductive;

(E) the difference between said CTEs of said semiconductor and said carrier being no more than about 1 to 2 ppm per degree centigrade;

(F) means making electrical connection with said semiconductor on one side thereof;

(G) means making electrical connection with said carrier;

(H) a cooling assembly thermally connected to said second side of said carrier for extracting heat therefrom conducted from said semiconductor;

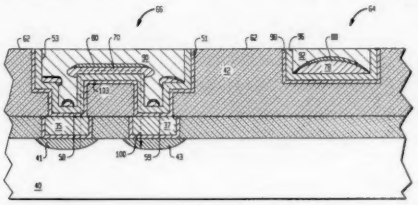
(I) said cooling assembly including a dielectric housing having a cooling fluid inlet for introduction of a cooling fluid, and a cooling fluid outlet.

6,016,008

INTEGRATED CIRCUIT INTERCONNECTION EMPLOYING TUNGSTEN/ALUMINUM LAYERS

Klaus Feldner, Fishkill, N.Y., assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. 08/413,557, Mar. 30, 1995, abandoned. This application Feb. 17, 1998, Appl. No. 24,998.
Int. Cl.[7] H01L *23/48;23/52;29/40*
U.S. Cl. 257—751 2 Claims



1. An integrated circuit interconnection for interconnecting at least first and second conductive regions in a substrate, said interconnection comprising:

a dielectric layer disposed above said substrate;

a runner disposed in said dielectric layer above said first and second conductive regions,

a first conductive barrier layer being disposed within said runner and spanning between said first and second conductive regions, said first conductive barrier layer being continuous;

a first aluminum layer overlying said first contiguous conductive barrier layer;

a second conductive barrier layer overlying said first aluminum layer;

a first tungsten layer overlying said second conductive barrier layer; and

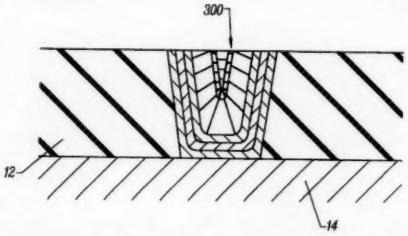
a second tungsten layer disposed between said first contiguous conductive barrier layer and said first aluminum layer, said second tungsten layer being configured to prevent a direct contact between said first aluminum layer with said first conductive barrier layer.

6,016,009

INTEGRATED CIRCUIT WITH TUNGSTEN PLUG CONTAINING AMORPHIZATION LAYER

Valeriy Y. Sukharev, Cupertino, and David J. Heine, Pleasanton, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of application No. 08/796,945, Feb. 7, 1997, Pat. No. 5,804,249. This application Apr. 27, 1998, Appl. No. 67,545.
Int. Cl.[7] H01L *23/48*
U.S. Cl. 257—763 24 Claims



14. An integrated circuit having a contact plug means for electrically connecting two vertically separated conductive or semiconductive layers, said contact plug means comprising a via formed in a dielectric layer, said via including an amorphous or microcrystalline tungsten layer means for inhibiting grain growth in a first bulk tungsten layer and promoting grain growth in a second bulk tungsten layer that is disposed above said amorphous or microc-

rystalline tungsten layer means, said amorphous or microcrystalline tungsten layer means is disposed above said first bulk tungsten layer.

6,016,010

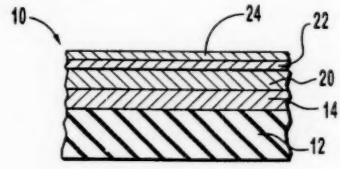
VOIDLESS METALLIZATION ON TITANIUM ALUMINIDE IN AN INTERCONNECT

Allen McTeer, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of application No. 08/596,639, Feb. 5, 1996, Pat. No. 5,700,718. This application Apr. 24, 1997, Appl. No. 840,022.

Int. Cl.[7] **H01L** *23/48;23/52;29/40*

U.S. Cl. 257—764 **25 Claims**



3. A semiconductor device having a metal interconnect structure and comprising:

a semiconductor substrate having a planar portion of a top surface;

a passivation layer over the planar portion of the top surface;

a titanium aluminide layer over the layer of he oxide of silicon, and

a void free conducting film upon the titanium aluminide layer, wherein any line perpendicular to the planar portion of the top surface of the semiconductor substrate intersects:

the planar portion of the top surface;

the passivation layer;

the titanium aluminide layer; and

the void free conducting film.

6,016,011

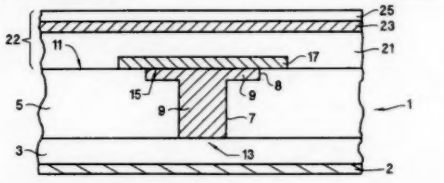
METHOD AND APPARATUS FOR A DUAL-INLAID DAMASCENE CONTACT TO SENSOR

Min Cao; Jeremy A Theil; Gary W Ray, all of Mountain View, and Dietrich W Vook, Menlo Park, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 27, 1999, Appl. No. 300,812

Int. Cl.[7] **H01L** *23/48;23/52;29/40*

U.S. Cl. 257—773 **12 Claims**



1. A dual-inlaid damascene contact comprising:

an electrically conductive layer;

a dielectric layer formed on the electrically conductive layer, the dielectric layer having a dual-inlaid cavity formed therein, the dual-inlaid cavity comprising a contact cavity formed in a portion of the dielectric layer, the contact cavity having a bottom surface, first sidewall surfaces, and an opening adjacent to a surface of the dielectric layer, and

a via cavity formed in a portion of the dielectric layer, the via cavity having second sidewall surfaces that extend the contact cavity to the electrically conductive layer, the electrically conductive layer having a via surface defined by an exposed portion of the electrically conductive layer adjacent to the via cavity;

a damascene contact disposed in the dual-inlaid cavity and in electrical communication with the electrically conductive layer, the damascene contact extending from the via surface to a contact surface adjacent to the opening of the contact cavity; and

a semiconductor layer formed on the surface of the dielectric layer and positioned over a portion of the contact surface and in electrical communication with the contact surface, whereby the damascene contact forms an interconnect structure between the electrically conductive layer and the semiconductor layer.

6,016,012

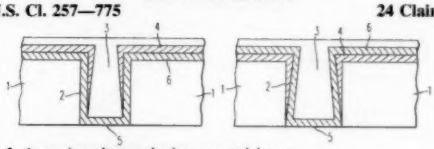
THIN LINER LAYER PROVIDING REDUCED VIA RESISTANCE

Ahmad Chatila, Santa Clara; Kuantai Yeh; James M. Cleeves, both of Redwood City; Daniel Arnzen, Fremont, and Roger Caldwell, Milpitas, all of Calif., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Nov. 5, 1996, Appl. No. 744,248

Int. Cl.[7] **H01L** *29/43*

U.S. Cl. 257—775 **24 Claims**



1. A semiconductor device, comprising:

i) a dielectric material;

ii) a channel formed in said dielectric material;

iii) a conductive material layer in said channel;

iv) a liner layer in said channel between said dielectric material and said conductive material deposited on a surface of said dielectric material; and

v) a second conductive material layer disposed between said liner layer and a bottom of said channel, wherein said second conductive material layer has a thickness $\leqq$500 Å,

wherein said channel has an aspect ratio of $\geqq$1.3 and said liner layer has a thickness $\geqq$500 Å and a thickness at a bottom of said channel of <100 Å,

and wherein said liner layer comprises an element selected from the group consisting of zirconium, hafnium, aluminum, chromium, molybdenum, tungsten, copper, nickel, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum, gold, silver, titanium-tungsten alloy and titanium nitride.

6,016,013

SEMICONDUCTOR DEVICE MOUNTING STRUCTURE

Mikio Baba, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 20, 1997, Appl. No. 915,272

Claims priority, application Japan, Aug. 20, 1996, 8-218351

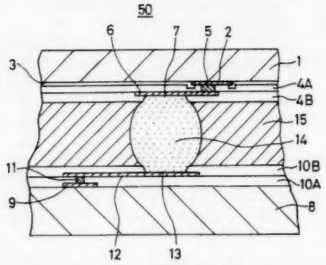
Int. Cl.[7] **H01L** *23/48;23/52;29/40*

U.S. Cl. 257—778 **15 Claims**

1. A flip-chip mounting structure for a semiconductor device in which a semiconductor device which is provided with a first electrode pad on a mounting surface thereof and a mounting board which is provided with a second electrode pad on a surface thereof, are connected to each other by means of a metal bump, said mounting structure comprising:

a first insulating means having a first conductive wiring pattern arranged inside thereof, formed on a front surface of said semiconductor device, and;

a second insulating means having a second conductive wiring pattern arranged inside thereof, formed on the front surface of



the mounting board, wherein each of said first and second insulating means is formed by at least two insulating resin layers stacked on each other with said first and second conductive wiring patterns respectively interposed therebetween,

a first insulating resin layer formed on a front surface of said semiconductor device, with first metal bump electrode pads to be electrically connected to said first electrode pad being formed onto a front surface of said first insulating resin layer, and

a second insulating resin layer formed on the front surface of the mounting board, with second metal bump electrode pads to be electrically connected to said second electrode pad being formed on a top surface of said second insulating resin layer,

said first and second metal bump electrode pads being mutually connected by said metal bumps;

said first electrode pad being offset connected to said metal bump through said first conductive wiring pattern and said second electrode pad being offset connected to said metal bump through said second conductive wiring pattern.

6,016,014

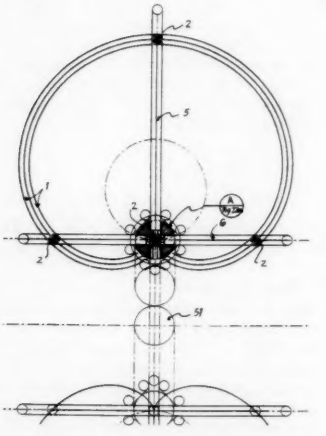
VERTICAL AXIS WIND ENERGY CONVERSION DEVICE HAVING PANELS GUIDED BY CARDIOID RAILS

Virgil Grigorescu, and Anca Grigorescu, both of 555 The West Mall #207, Etobicoke, Ontario, Canada, M9C 1G8

Filed Aug. 19, 1996, Appl. No. 699,444

Int. Cl.[7] F03D *9/00*

U.S. Cl. 290—55 **10 Claims**



1. A wind energy conversion device having at least one system which comprises;

a sail, reacting to the wind force, and having an inferior arm and superior arm and a wheel at each end at least one said arms;

said wheels are constrained to move by at least one cardioid shaped rail guide;

a principal shaft, situated at the cusp of said cardioid shaped rail guide, is coupled to an electric generator;

at least one of said arms slides perpendicularly to the axis of rotation the principal shaft to transmit the cardioid movement of the sail into a rotational movement of the principal shaft.

6,016,015

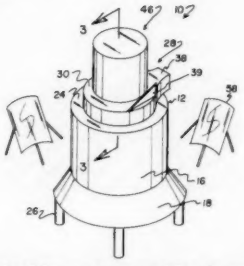
SOLAR-WIND TURBINE

Bruce L. Willard, Jr., P.O. Box 11, Bonanza, Oreg. 97623

Filed Sep. 5, 1997, Appl. No. 924,674

Int. Cl.[7] F03D *9/00*; **F03G** *6/00*

U.S. Cl. 290—55 **8 Claims**



1. A solar-wind turbine system comprising, in combination:

a base including an outer shell constructed from a transparent material, the outer shell including an upper extent with a hollow cylindrical configuration and a lower extent, the outer shell including a lower extent having an inverted frusto-conical configuration integrally coupled in coaxial relationship with the upper extent, the base further including an inverted horn-shaped inner shell with an arcuate tapering periphery formed of a dark colored heat conductive material, the inner shell defining a substantially vertical air path through the base, the inner shell having a lower air entry opening and an upper air exit opening, the lower air entry opening and the upper air exit opening being oriented in substantially parallel horizontal planes, the lower air entry opening forming a substantially circular mouth for receiving air from below the inner shell, the inner shell having a helix formed in an interior space thereof for imparting a helical flow pattern to air flowing through the inner shell, the inner shell being coupled to the outer shell by a plurality of connection rods wherein a space is formed between the inner shell and outer shell for trapping therebetween air heated by sunlight shining through the transparent outer shell;

a plurality of vertically oriented stanchions, each of the stanchions being connected to a bottom surface of the outer shell for supporting the outer shell on a ground surface, each of the stanchions depending downwardly from the outer shell for elevating the lower air entry opening of the inner shell above the ground surface in a spaced relationship with the ground surface to permit air to flow between the inner shell and the ground surface such that heated air may rise into the air path through the lower air entry opening;

a propeller assembly including a disk-shaped housing with a circular top face, the tope face having a circular bore centrally formed therein, the tope face having a periphery depending therefrom and defining an open bottom, the periphery of the disk-shaped housing being rotatably coupled to an open top of the inner shell of the base, the periphery having a tapered outlet formed therein, the periphery extending radially outward therefrom, the propeller assembly including a propeller situated in the disk-shaped housing, the propeller assembly including a hollow vertically oriented tubular shaft rotatably situated through the circular bore of the disk-shaped housing, the tubular shaft extending upwardly from the propeller;

a generator assembly including an inverted T-shaped support, the T-shaped support including a thin horizontal member fixedly coupled in the interior space of the inner shell, the

T-shaped support including a vertical member rotatably situated through the hollow shaft of the propeller, a stator coupled to the vertical member of the support of the generator assembly in a manner adapted for maintaining the stator in a fixed orientation with respect to the base, and a rotor fixed with respect to the shaft of the propeller;

a plurality of mirrors positioned at spaced locations from the base such that the mirrors reflect sun light through the transparent outer shell and onto the dark inner shell for heating the air in the inner shell to cause heated air to rise through the inner shell;

whereby an air current is generated through the helix of the base from the lower air entry opening of the inner shell to the tapered outlet of the disk-shaped housing of the turbine assembly thereby effecting the rotation of the propeller and the rotor with respect to the stator to generate power, the disk-shaped housing of the turbine assembly being adapted to rotate such that the tapered outlet is aligned in the direction of the wind.

6,016,016

VOLTAGE SUPPLY APPARATUS

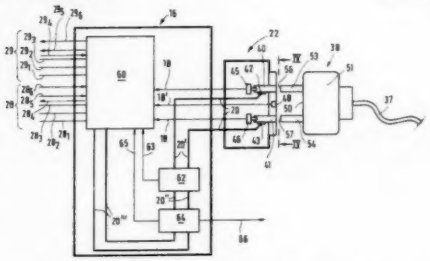
Henry Starke, Ellerbek, and Andrew Muirhead, Hamburg, both of Germany, assignors to Luftansa Technik AG, Hamburg, Germany

Filed May 28, 1998, Appl. No. 85,113

Claims priority, application Germany, May 31, 1997, 197 22 922

Int. Cl.[7] **H02J** *3/06*

U.S. Cl. 307—9.1 **15 Claims**



1. A voltage supply apparatus for providing a supply voltage for an electric device comprising a socket to which an electric device is adapted to be connected by means of a plug, means for supplying supply voltage to the socket, the socket including plug detector means for detecting the presence of a plug inserted in the socket, said voltage supplying means being provided remotely from the socket and being connected to the socket by a signal line and a supply line, the voltage supplying means being constructed and arranged for applying the supply voltage to the socket when the plug detector means indicates the presence of a plug over the signal line to the voltage supplying means, the plug detector means being constructed and arranged to detect the presence of contact pins of a plug in the socket, and control means responsive to plug presence detection by said plug detector means for rendering the voltage supplying means operative to supply the supply voltage to the socket only if the time between the detection of a first contact pin and the subsequent detection of a second contact pin of the plug does not exceed a predetermined maximum time value.

6,016,017

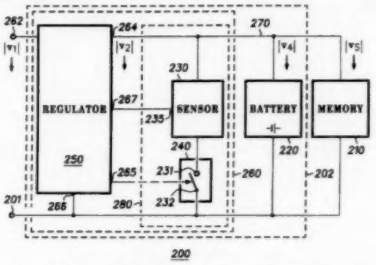
SYSTEM FOR PROVIDING AN UNINTERRUPTED SUPPLY VOLTAGE AND METHOD

Petr Kadanka, Roznov pod Radhostem, and Antonin Rozsypal, Hutisko - Solanec, both of Czech Rep., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 12, 1997, Appl. No. 989,726

Int. Cl.[7] **H02J** *7/00*

U.S. Cl. 307—64 **8 Claims**



1. A system for providing an uninterrupted supply voltage to a node, said system comprising:

a regulator temporarily receiving a first voltage $|V_1|$ and temporarily providing a second voltage $|V_2|$ to said node;

a battery unit continuously providing a third voltage $|V_4|$ to said node;

a switchable sensor which is temporarily coupled to said node to measure said second voltage $|V_2|$ and to provide a measurement signal to said regulator, where said swichable sensor has a switch controlled by said regulator for disconnecting said sensor from said battery unit when said regulator does not provide said second voltage $|V_2|$ to prevent current backflow from said battery unit to said switchable sensor.

6,016,018

ELECTRONIC APPARATUS INCORPORATING BATTERY

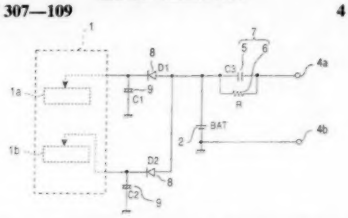
Kazuo Hasegawa, and Daisuke Takai, both of Miyagi-ken, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 21, 1997, Appl. No. 975,954

Claims priority, application Japan, Nov. 22, 1996, 8-327935

Int. Cl.[7] **H02M** *3/06*

U.S. Cl. 307—109 **4 Claims**



1. An electronic apparatus incorporating battery comprising:

a source battery for generating a DC voltage, said source battery having a positive terminal and a negative terminal;

a driven circuit connected to one of said terminals of said source battery such that said driven circuit is driven by said source battery;

two external terminals, one of the external terminals connected to the positive terminal of said source battery, the other of the external terminals connected to the negative terminal of said source battery;

a capacitor connected in series between one of the positive terminal and the negative terminal of said source battery and one of said external terminals,

a battery voltage identification circuit having a detection circuit to detect a current of said capacitor; and

wherein said two external terminals are connected and disconnected by said battery voltage identification circuit.

6,016,019

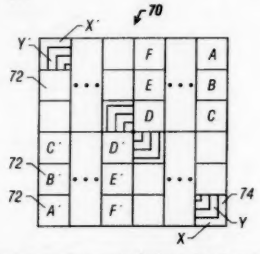
CAPACITOR ARRAY ARRANGEMENT FOR IMPROVING CAPACITOR ARRAY MATCHING

Igor Wojewoda, Tempe, Ariz., assignor to Microchip Technology Incorporated, Chandler, Ariz.

Filed May 28, 1998, Appl. No. 85,827

Int. Cl.[7] H03M *1/80*

U.S. Cl. 307—109 **27 Claims**



1. A capacitor array layout technique for improving capacitor array matching comprising the steps of:

providing a capacitor array;

laying said capacitor array in a geometrical configuration wherein said geometrical configuration has a centerpoint;

dividing said geometrical configuration into a plurality of first sections wherein each of said plurality of first sections has a corresponding second section diagonally located from said first section and at an approximately equal distance from said centerpoint as said first section;

dividing at least one of said plurality of first sections into a plurality of first sub-sections;

dividing said corresponding second section of said at least one of said plurality of first sections into a plurality of second sub-sections wherein each of said plurality of first sub-sections has a corresponding second sub-section diagonally located from and at an approximately equal distance from said centerpoint;

housing in each of said first and second sections which are not divided into a plurality of sub-sections a capacitor set of a predetermined value wherein each of said plurality of first sections which are not divided into a plurality of sub-sections house a capacitor set of an equal value as said corresponding second section; and

housing in each of said plurality of first and second sub-sections a sub-capacitor set of a predetermined value wherein each of said plurality of first sub-sections house a sub-capacitor set of an equal value as said corresponding second sub-section and wherein the sub-capacitor sets of a divided section are of non-equal value.

6,016,020

METHOD AND APPARATUS USING LOW VOLTAGE LEVEL ACTUATOR TO CONTROL OPERATION OF ELECTRICAL APPLIANCE

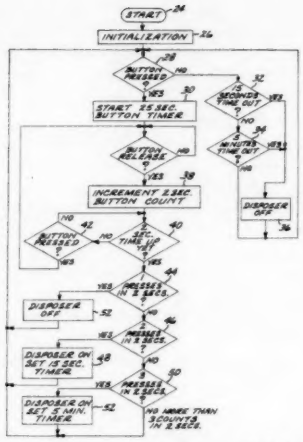
David J. Cline, Newport Beach, and Paul Rosenau, Santa Ana, both of Calif., assignors to Balboa Instruments, Inc., Costa Mesa, Calif.

Filed Sep. 3, 1997, Appl. No. 922,757

Int. Cl.[7] B02C *18/40*

U.S. Cl. 307—125 **12 Claims**

1. A method of using a low voltage level actuator in a potentially moisture laden environment to initiate electrical coupling of an electrical appliance with a switch circuit that is associated with a relatively high voltage power source, the method comprising the steps of:



providing a low voltage level actuator which is electrically isolated from the high voltage power source, and wherein the actuator includes a deflectable area constituting a button whose depression results in passage of a relatively low voltage level electrical signal from the actuator;

locating the button in a working surface accessible to a user; and

electrically coupling the actuator to a signal processing means is a microprocessor operative by electrical signals from the actuator to stop operation of the appliance following one button depression, to operate the appliance for one time duration following two button depressions, and to operate the appliance for a second time duration following three button depressions.

6,016,021

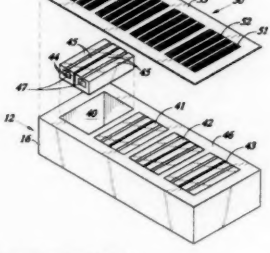
LINEAR STEPPER MOTOR

Walter E. Hinds, Beverly Hills, Calif., assignor to Northern Magnetics, Inc., Santa Clarita, Calif.

Continuation of application No. 09/026,621, Feb. 20, 1998, Pat. No. 5,965,962. This application Apr. 12, 1999, Appl. No. 290,081.

Int. Cl.[7] H02K *41/00*

U.S. Cl. 310—12 **31 Claims**



1. A linear motor comprising:

a forcer for movement over a platen,

bearing means between the platen and the forcer,

the platen having teeth directed transversely to the direction of movement of the forcer over the platen, and

the forcer having a series of teeth directed towards the platen and being for substantially parallel relationship with the teeth in the platen, and

the teeth in the forcer being created by an etching process.

6,016,022

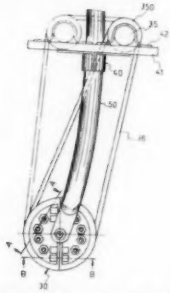
ELECTRICITY GENERATING SYSTEM FOR BICYCLE

Kunlin Cho, 17 Alley 1, Lane 43, Tapeng Rd., Taichung, Taiwan

Filed Feb. 23, 1998, Appl. No. 27,795

Int. Cl.[7] **H02K** *7/10*

U.S. Cl. 310—75 C **2 Claims**



1. An electricity generating system on a bicycle with forks, a bicycle wheel and a front hub with spokes on said bicycle wheel, comprising:

a driving wheel surrounding said front hub and performing a rotating movement along with said bicycle wheel;

a support, mounted on said fork with a connecting plate;

at least a dynamo with a drive wheel, being held by said connecting plate; and

a conveyor belt, enclosing said driving wheel and said at least a dynamo, driving said at least a dynamo via said rotating movement so as to generate electricity;

characterized in that

said driving wheel further comprising

a first half-wheel, having a first semicircular rim with a plurality of transverse holes, a first interface with a plurality of transverse holes aligning with said transverse holes on said rim, a first central semicircular recess surrounding said front hub, and at least two spaced radial holes between said first rim and said first recess;

a second half-wheel, being opposite to said first half-wheel, having a second semicircular rim, a second interface with transverse threaded holes corresponding to said transverse holes on said first half-wheel, a second central semicircular recess surrounding said front hub to allow said first and second interfaces contacting each other, and at least two spaced radial holes between said second rim and said second recess;

a plurality of screws, passing through said transverse holes and secured to said transverse threaded holes; and

at least a U-shaped pin, said U-shaped pin enclosing a pair of said spokes and having two legs with threads, said legs passing through said two spaced radial holes on said first half-wheel or on said second half-wheel, and being secured by a nut respectively;

said support further comprising

two opposite pipe clip halves, surrounding said forks and fastened to each other on said forks, each of said clips being fastened to said connecting plate, and

at least a clip with middle arc, being attached on said connecting plate to hold said dynamo.

6,016,023

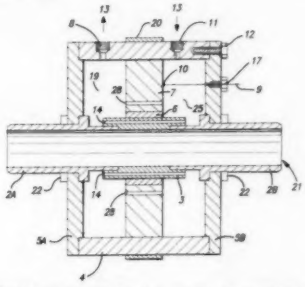
TUBULAR ULTRASONIC TRANSDUCER

Bo Nilsson, Öregrund, and Håkan Dahlberg, Långbackavägen, both of Sweden, assignors to Ultra Sonus AB, Oregrund, Sweden

Filed May 12, 1998, Appl. No. 75,833

Int. Cl.[7] **H01L** *41/04*

U.S. Cl. 310—341 **10 Claims**



1. A method for improving the output of an ultrasonic transducer, for use with a transducer of the type employing at least one piezoelectric element disposed around a central axis of a central fluid pipe having a first open end, an opposite second open end, and a liquid flow path therebetween, such that an alternating voltage applied to the at least one piezoelectric element urges it to vibrate in a radial direction with respect to the central axis to transmit ultrasonic energy into the central fluid pipe, the at least one piezoelectric element further being encased in a fluidum-tight casing,

the method comprising the steps of:

providing the transducer casing with at least one gas inlet and at least one gas outlet;

providing a gas conducting member in contact with and surrounded by said at least one piezoelectric element, and between said at least one piezoelectric element and a length of said liquid flow path, in such a way that there is a gas flow path connecting the gas conducting member to said gas inlet and to said gas outlet, respectively;

selecting a cooling gas;

urging a liquid to flow through said length of said liquid flow oath, said length being surrounded by said at least one piezoelectric element;

transmitting ultrasonic energy into said length; and

urging said cooling gas between said at least one piezoelectric element and said liquid flow path by urging said cooling gas through the gas conducting member, thereby cooling the at least one piezoelectric element.

6,016,024

PIEZOELECTRIC COMPONENT

Toshihiko Unami; Jiro Inoue, both of Omihachiman; Takashi Yamamoto, Ishikawa-ken, and Tetsuo Takeshima, Toyama, all of Japan, assignors to Murata Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1997, Appl. No. 832,072

Claims priority, application Japan, Apr. 5, 1996, 8-110475; Apr. 18, 1996, 8-122725; Aug. 5, 1996, 8-223029; Jan. 16, 1997, 9-020102; Jan. 16, 1997, 9-020103

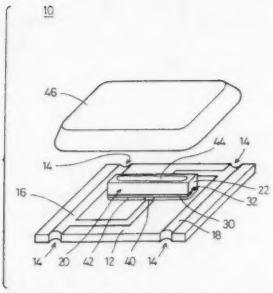
Int. Cl.[7] **H01L** *41/08*

U.S. Cl. 310—345 **18 Claims**

1. A piezoelectric component comprising:

at least one piezoelectric resonator adapted to vibrate in a longitudinal vibration mode along a longitudinal axis of the at least one piezoelectric resonator, the at least one piezoelectric resonator comprising a single unitary resonator block including a laminated body of a plurality of piezoelectric layers and electrodes disposed between the piezoelectric layers;

means for driving said at least one piezoelectric resonator for vibrating said at least one piezoelectric resonator such that a



node point is defined approximately at a center point of the at least one piezoelectric resonator;

a supporting substrate having a support surface for supporting said piezoelectric resonator in a manner such that the longitudinal axis along which the at least one piezoelectric resonator vibrates in the longitudinal vibration mode when driven by said means for driving is substantially parallel to the support surface of the supporting substrate; and

an elastic material provided between said piezoelectric resonator and said supporting substrate.

6,016,025

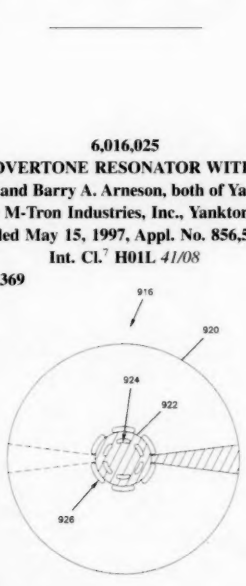
SELECTED OVERTONE RESONATOR WITH CHANNELS

Cyle E. Wold, and Barry A. Arneson, both of Yankton, S. Dak., assignors to M-Tron Industries, Inc., Yankton, S. Dak.

Filed May 15, 1997, Appl. No. 856,543

Int. Cl.[7] **H01L** *41/08*

U.S. Cl. 310—369 **22 Claims**



1. A resonator, comprising:

a blank having piezoelectric properties, wherein the blank oscillates when stimulated;

a plurality of electrodes, coupled to the blank, for providing a signal to the blank to cause the blank to become stimulated and oscillate at a fundamental frequency; and

a channel cut into the blank, the position and dimension of the channel being selected to confine the oscillation to a region that maximizes the response at a desired frequency, the channel being formed by a plurality of discrete slots arranged to surround at least one of the electrodes, the slots being positioned directly at an outer edge of the at least one electrode.

6,016,026

IMPREGNATED CATHODE FOR LOW POWER CATHODE-RAY TUBE

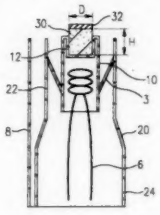
Jong Hwan Lee, Kyungsangbuk-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Dec. 9, 1997, Appl. No. 987,199

Claims priority, application Rep. of Korea, Dec. 11, 1996, 96-64162

Int. Cl.[7] **H01J** *29/04;19/22*

U.S. Cl. 313—346 R **22 Claims**



1. A cathode comprising:

a pellet;

a cup;

an inner sleeve;

a tab; and

an outer sleeve, wherein a diameter of said pellet is less than at least one and one-half (1.5) times a thickness of said pellet, and an outer diameter of a bottom part of said outer sleeve is larger than an outer diameter of a top part of said outer sleeve.

6,016,027

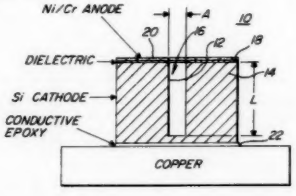
MICRODISCHARGE LAMP

Thomas A. DeTemple; James Frame, both of Champaign; David J. Wheeler, Urbana, and J. Gary Eden, Mahomet, all of Ill., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed May 19, 1997, Appl. No. 858,235

Int. Cl.[7] **H01J** *1/16*

U.S. Cl. 313—356 **9 Claims**



1. A discharge lamp comprising:

a one piece integral semiconductor;

a dielectric formed upon said semiconductor;

an anode electrically isolated from said semiconductor by said dielectric;

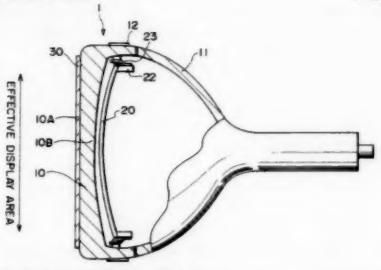
a microcavity penetrating said dielectric and said anode, and extending into said semiconductor, said microcavity defining a hollow cathode in said semiconductor; and

discharge filler within said microcavity.

6,016,028
GLASS BULB FOR COLOR PICTURE TUBE AND THE SAME TUBE

Yukinobu Iguchi; Ichiro Utsumi, and Koji Saita, all of Kanagawa, Japan, assignors to Sony Corporation, Japan

Filed Aug. 19, 1997, Appl. No. 914,118
Claims priority, application Japan, Aug. 23, 1996, 8-241364
Int. Cl.[7] H01J *29/80;29/10;31/00;61/30*
U.S. Cl. 313—402 **9 Claims**



1. A cathode ray tube comprising:

a glass bulb in which an external surface of an effective display area of a face plate is substantially flat and a peripheral area in the horizontal direction of the effective display area of the face plate is thicker than a center of the effective display area; and

a color selection mechanism having a curvature projected toward the face plate provided opposed to an internal surface of the face plate within the glass bulb.

6,016,029
RAW MATERIAL FOR MAGNETIC SHIELD, PRODUCTION METHOD THEREOF, AND COLOR TELEVISION RECEIVER

Hironao Okayama, and Akira Ikeda, both of Yamaguchi, Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/02217, § 371 Date Feb. 6, 1998, § 102(e) Date Feb. 6, 1998, PCT Pub. No. WO97/06285, PCT Pub. Date Feb. 20, 1997
PCT Filed Aug. 6, 1996, Appl. No. 377
Claims priority, application Japan, Aug. 7, 1995, 7-219478
Int. Cl.[7] H01J *29/80*
U.S. Cl. 313—402 **5 Claims**

1. A color picture tube incorporating a magnetic shield material having been produced by subjecting a hot rolled low carbon steel strip consisting essentially of equal to or less than 0.006 wt % of C, equal to or less than 0.002 wt % of N, equal to or less than 0.5 wt % of Mn, 0.1–1.5 wt % of Cu, unavoidable impurities and Fe as balance to a cold rolling and subsequent annealing of the cold rolled steel strip at a temperature of 550–850° C.

6,016,030
COLOR CATHODE-RAY TUBE WITH INTERMEDIATE ELECTRODE

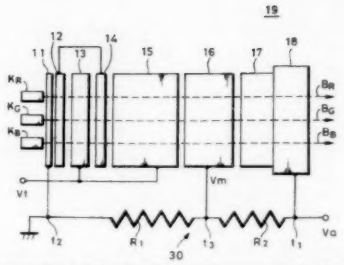
Yasunobu Amano, Toyko; Koji Ichida, Kanagawa; Naruhiko Endo, Fukushima; Yoichi Ohshige, and Masahiko Mizuki, both of Kanagawa, all of Japan, assignors to Sony Corporation, Japan

Filed Mar. 18, 1997, Appl. No. 820,657
Claims priority, application Japan, Mar. 26, 1996, 8-070466; Jan. 30, 1997, 9-016767
Int. Cl.[7] H01J *29/51*
U.S. Cl. 313—414 **10 Claims**

1. A color cathode-ray tube comprising:

a focusing electrode applied with a focusing voltage;

an anode electrode applied with an anode voltage; and



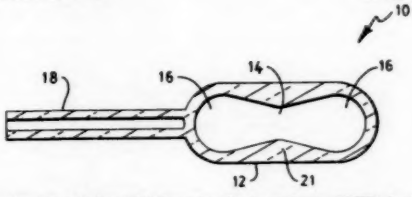
an intermediate electrode disposed between said focusing electrode and said anode electrode and provided with an intermediate voltage which is higher than said focusing voltage and lower than said anode voltage, said intermediate electrode being maintained at a potential by said intermediate voltage through an incorporated dividing resistor, wherein

each of said focusing electrode, said anode electrode and said intermediate electrode is formed of a cylindrical body of an elliptical cross-section closed by an electric field correcting electrode plate having three electrode beam penetrating portions bored therethrough so as to be arrayed in an in-line fashion.

6,016,031
HIGH LUMINANCE ELECTRODELESS PROJECTION LAMP

Walter P. Lapatovich, Boxford; Gerhard W. Doell, Beverly, and Robert K. Smith, Wilmington, all of Mass., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Aug. 11, 1997, Appl. No. 909,323
Int. Cl.[7] H01J *1/62;63/04;17/16;61/30*
U.S. Cl. 313—493 **25 Claims**



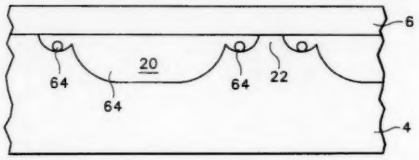
1. An electrodeless high intensity discharge lamp (EHID) having means for producing an electric discharge within its light transmissive envelope, said light transmissive envelope having a constriction formed about a mid-portion thereof, said constriction increasing power density to said electric discharge sustained within the envelope, said envelope being filled with a volatizable fill that is capable of being energized into a light emitting state.

6,016,032
PALC PANEL WITH WIRE ELECTRODES

Thomas S. Buzak; Kevin J. Ilcisin, both of Beaverton; Paul C. Martin, Sunriver, all of Oreg.; Hans J. G. A. Den Biggelaar; Jacob Bruinink, both of Eindhoven, Netherlands; Petrus Franciscus Gerardus Bongaerts, Waalre, Netherlands; Adrianus Leonardus Josephus Burgmans, Eindhoven, Netherlands; Babar Ali Khan, Ossining, N.Y., and Henri Roger Jules Richard Van Helleputte, Eindhoven, Netherlands, assignors to Tektronix, Inc., Wilsonville, Oreg., and Philips Electronics North America Corporation, Tarrytown, N.Y.

Filed Dec. 15, 1997, Appl. No. 990,693
Int. Cl.[7] H01J *1/62*
U.S. Cl. 313—493 **10 Claims**

1. An intermediate structure in manufacture of a PALC panel, comprising a channel member having at least one channel in a



surface thereof and a wire of length at least as great as that of the channel, the wire being located in the channel.

6,016,033

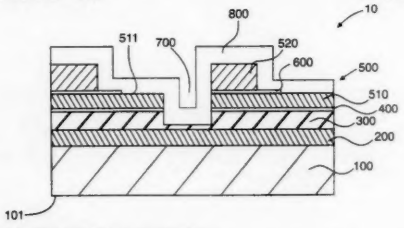
ELECTRODE STRUCTURE FOR HIGH RESOLUTION ORGANIC LIGHT-EMITTING DIODE DISPLAYS AND METHOD FOR MAKING THE SAME

Gary W. Jones; Webster E. Howard, both of Lagrangeville, and Steven M. Zimmerman, Pleasant Valley, all of N.Y., assignors to Fed Corporation, Hopewell Junction, N.Y.

Provisional application No. 60/052,347, Jul. 11, 1997. This application May 7, 1998, Appl. No. 73,798.

Int. Cl.[7] H05B *33/12*

U.S. Cl. 313—506 **24 Claims**



12. A display device comprising:

at least one organic light emitting diode device, wherein each of said at least one organic light emitting diode device comprises;

a substrate;

a first conductor located on said substrate;

an organic light emitting layer located on said first conductor;

a second conductor located on said organic light emitting layer, wherein said second conductor comprises a transparent electrode layer, wherein said transparent electrode layer having a surface, and at least one conductive rib disposed along a narrow portion of said surface on said transparent electrode layer;

a first conductive barrier located between said transparent electrode layer and said at least one conductive rib; and

a second conductive layer located between said transparent electrode layer and said organic light emitting layer.

6,016,034

METHOD FOR FORMING SUPPORTED THIN LAYERS OF NON-EVAPORABLE GETTER MATERIAL AND GETTER DEVICES FORMED THEREBY

Alessio Corazza, Como; Claudio Boffito; Alessandro Gallitognotta, both of Milan, all of Italy; Richard C. Kullberg, and Michael L. Ferris, both of Colorado Springs, Colo., assignors to SAES Getters S.p.A., Milano, Italy

Division of application No. 08/855,080, May 13, 1997, Pat. No. 5,882,727. This application Sep. 17, 1998, Appl. No. 154,800.

Claims priority, application Italy, Jul. 23, 1996, MI96A1533

Int. Cl.[7] H01J *17/24*

U.S. Cl. 313—553 **5 Claims**

1. A getter device having a supported thin layer of getter material formed by a method comprising:

preparing at least one suspension comprised of non-evaporable getter (NEG) material particles in a dispersing medium, said NEG particles having a particle size not greater than about 150 μm, said dispersing medium having an aqueous, alcoholic, or hydroalcoholic base and containing not more than about 1 wt % of organic compounds having a boiling temperature of at least about 250° C., wherein a ratio of a weight of said NEG material particles to a weight of said dispersing medium is between about 4:1 and about 1:1;

depositing at least one layer of said suspension on a carrier by a serigraphic technique;

drying said at least one deposited layer to evaporate volatile components of said dispersing medium and thereby form a dried deposit; and

sintering said dried deposit under vacuum at a temperature between about 800° C. and about 1000° C. with a surface of said dried deposit covered with a refractory material to inhibit scaling, whereby a layer comprised of NEG material supported on said carrier is obtained.

6,016,035

LIGHT ASSEMBLY, PREFERABLY TAIL LIGHT ASSEMBLY, OF A VEHICLE, PREFERABLY A MOTOR VEHICLE

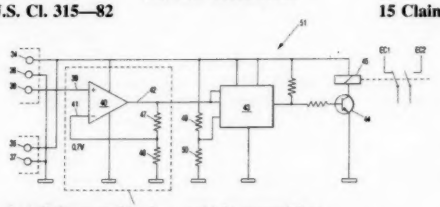
Helmut Eberspächer, Esslingen; Winfried Hardy Gauch, Magstadt; Helmut Haf, Schwaikheim, and Wolfgang Robel, Filderstadt-Sielmingen, all of Germany, assignors to Reitter & Schefenacker GmbH & Co. KG, Germany

Filed Apr. 10, 1998, Appl. No. 59,059

Claims priority, application Germany, Apr. 10, 1997, 197 14 849

Int. Cl.[7] H05B *37/02*

U.S. Cl. 315—82 **15 Claims**



1. A light assembly for a vehicle comprising:

at least one light source connected to a circuit, wherein said at least one light source has a light output adjustable according to external light conditions;

wherein said circuit comprises a light switch, wherein the light output of said at least one light source is adjusted according to a selected position of said light switch;

wherein said circuit further comprises first switches positioned in electrical lines connecting said light switch to said at least one light source;

wherein each one of said first switches has a parallel-switched dimmer for reducing light output of said at least one light source;

wherein said light switch and said first switches are connected such that when said light switch is switched on, said first switches are open and when said light switch is turned off, said first switches are closed;

wherein said first switches, when closed, bridge said dimmers to increase the light output.

6,016,036

MAGNETIC FILTER FOR ION SOURCE

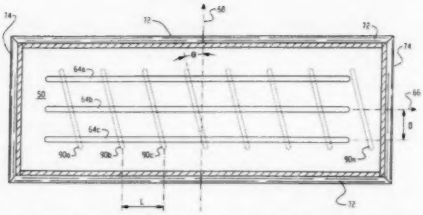
Adam A. Brailove, Gloucester, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 28, 1998, Appl. No. 14,472

Int. Cl.[7] H01J *27/02;* **H05H** *1/10*

U.S. Cl. 315—111.71 **18 Claims**

1. A magnetic filter (**90**) for an ion source (**26**) comprising a housing defining a plasma confinement chamber (**76**) in which a



plasma including ions is generated by ionizing a source material, the housing including a generally planar wall (**50**) in which are formed a plurality of elongated apertures (**64**) through which an ion beam (**84**) may be extracted from the plasma, the plurality of elongated openings oriented substantially parallel to each other and to a first axis (**66**) which lies within said planar wall, the first axis being substantially orthogonal to a second axis (**68**) which lies within the planar wall; said magnetic filter comprising:

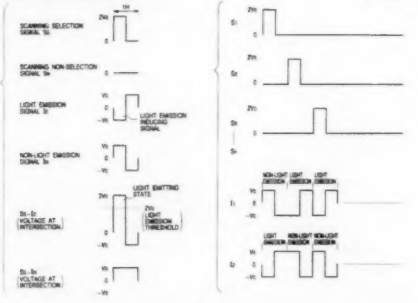
a plurality of elongated magnets (**90***a*–**90***n*) disposed within the plasma confinement chamber (**76**) for separating the plasma confinement chamber into a primary region (**86**) and a secondary region (**88**), said plurality of elongated magnets being oriented neither parallel to nor orthogonal to said second axis (**68**) but instead oriented at an acute angle θ as measured from said second axis (**68**) and lying parallel to each other and within a plane which is generally parallel to the generally planar wall (**50**).

6,016,037

ELECTROLUMINESCENCE APPARATUS AND DRIVING METHOD THEREOF

Masaki Kuribayashi, Inagi; Yuichi Hashimoto; Akihiro Senoo, both of Tokyo; Kazunori Ueno, Ebina, and Hidetoshi Tsuzuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1998, Appl. No. 89,257
Claims priority, application Japan, Jun. 11, 1997, 9-153669
Int. Cl.[7] **G09G** *3/10*
U.S. Cl. 315—169.3 **26 Claims**



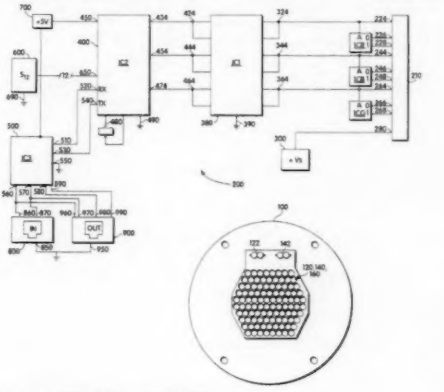
1. An electroluminescence apparatus comprising: first means having a scanning signal line and an information signal line of wires intersecting with each other, and an electroluminescence member provided at an intersection between the scanning signal line and the information signal line; and second means for sequentially applying a scanning selection signal comprising a first phase and a second phase of mutually different voltage waveforms to the scanning signal line, applying a light emission inducing signal to create a voltage over a threshold for light emission of the electroluminescence member in synchronism with one of the first phase and the second phase, to the information signal line, and applying a light emission non-inducing signal comprised of a voltage different from that of the light emission inducing signal, in synchronism with the other phase to the information signal line, thereby applying an alternating voltage to the electroluminescence member during a non-selection period of scanning.

6,016,038

MULTICOLORED LED LIGHTING METHOD AND APPARATUS

George G. Mueller, Boston, Mass., and Ihor A. Lys, Pittsburgh, Pa., assignors to Color Kinetics, Inc., Boston, Mass.

Filed Aug. 26, 1997, Appl. No. 920,156
Int. Cl.[7] **H05B** *37/02*
U.S. Cl. 315—291 **25 Claims**



1. Light apparatus comprising:

a power terminal;

at least one LED coupled to the power terminal;

a current sink coupled to the at least one LED, the current sink comprising an input responsive to an activation signal enables flow of current through the current sink;

an addressable controller having an alterable address, the controller coupled to the input and having timing means for generating the activation signal for a predefined portion of a timing cycle;

the addressable controller further comprising means for receiving data corresponding to the alterable address and indicative of the predefined portion of the timing cycle:

a second LED coupled to the power terminal and the current sink;

the current sink comprising a second input corresponding to the second LED and responsive to a second activation signal;

the addressable controller comprising second timing means for generating the second activation signal for a second predefined portion of the timing cycle, and further comprising second means for receiving data corresponding to the alterable address and indicative of the second predefined portion of a timing cycle.

6,016,039

CONTROL PROCESSES FOR LINEAR VOICE COIL ACTUATOR

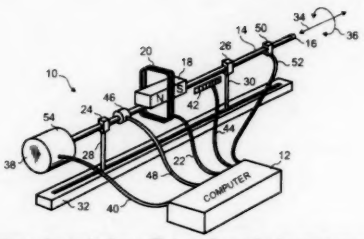
Edward A. Neff, Rancho Santa Fe; Michael S. Sheaffer, Escondido; Michael A. Ferris, Vista; David Huang, Carlsbad; Steven Haidos, Vista; Kieran Boyle, San Diego, and Dennis Stom, Solana Beach, all of Calif., assignors to Systems, Machines, Automation Components Corporation, Carlsbad, Calif.

Filed Dec. 5, 1997, Appl. No. 985,493
Int. Cl.[7] **H02K** *41/00*
U.S. Cl. 318—115 **19 Claims**

1. A method for controlling the linear and angular reaction of a probe of a voice coil actuator in accordance with pre-programmed instructions, the method comprising the steps of selectively:

determining an actual linear position of the probe (z);

comparing z with the preprogrammed instructions to generate a linear error signal (e_z);



exerting a dynamic force (F_{zd}) on the probe in response to e_z to move the probe in translation for position control;

exerting a variable static force (F_{zs}) on the probe when e_z is equal to zero;

determining the actual angular position of the probe (θ);

comparing θ with the preprogrammed instructions to generate an angular error signal (e_θ);

exerting a dynamic angular force ($F_{\theta d}$) on the probe in response to e_θ to move the probe in rotation for angular control; and

exerting a variable static angular force ($F_{\theta s}$) on the probe when e_θ is equal to zero.

6,016,040

DEVICE AND METHOD FOR DRIVING AT LEAST ONE CAPACITIVE ACTUATOR

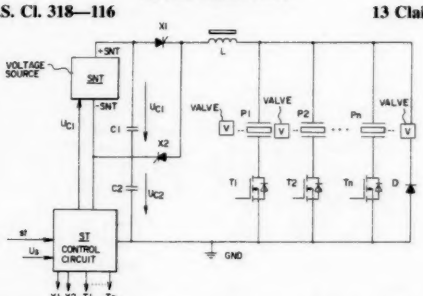
Christian Hoffmann, Regensburg; Hellmut Freudenberg, Grossberg; Hartmut Gerken, Nittendorf; Martin Hecker, Laimerstadt, and Richard Pirkl, Regensburg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. PCT/DE97/01540, Jul. 22, 1997. This application Feb. 16, 1999, Appl. No. 250,865.

Claims priority, application Germany, Aug. 14, 1996, 196 32 837

Int. Cl.[7] **H01L** *41/08*

U.S. Cl. 318—116 **13 Claims**



1. In combination with a control circuit, a device for driving at least one capacitive actuator and controlled by the control circuit, comprising:

an earth potential-free voltage source regulated by the control circuit and having a positive pole and a negative pole;

a charge capacitor disposed between said positive pole and said negative pole and being charged by said earth potential-free voltage source;

a first series circuit disposed in parallel with said charge capacitor and including a charge switch connected to said positive pole through which current can flow away from said positive pole and a discharge switch connected to said negative pole through which current can flow to said negative pole;

an earth connection;

a recharge capacitor disposed between said negative pole and said earth connection;

a ring-around coil having a first side connected to a node connection point of said charge switch and said discharge switch and a second side to be connected to an actuator to be driven;

a controlled power MOSFET switch having a first side connected to said earth connection and a second side to be connected to the actuator to be driven, said controlled power MOSFET switch and the actuator defining a second series circuit;

at least one further controlled power MOSFET having a first side connected to said earth connection and a second side to be connected to a first side of at least one further actuator, said second side of said ring-around coil to be connected to a second side of the at least one further actuator, said at least one further controlled power MOSFET switch and the at least one further actuator defining a third series circuit connected in parallel with said second series circuit; and

a diode disposed between said second side of said ring-around coil and said earth connection and through which current can flow from said earth connection to said ring-around coil.

6,016,041

ROTARY SPEED CONTROL CIRCUIT FOR FEEDING A DC UNIVERSAL MOTOR

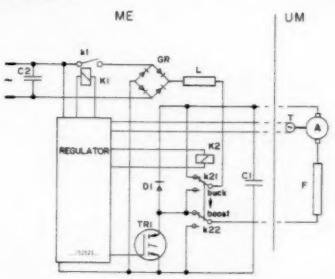
Martin Weinmann, Bald Waldsee, Germany, assignor to Ako-Werke GmbH & Co., KG, Wangen, Germany

Filed Sep. 22, 1997, Appl. No. 936,147

Claims priority, application Germany, Sep. 25, 1996, 196 39 310; Nov. 6, 1996, 196 45 667

Int. Cl.[7] **H02K** *23/64*

U.S. Cl. 318—245 **2 Claims**



1. In a rotary speed control circuit for feeding a DC universal motor, such as for driving a washing machine, including a rectifier (GR) and a smoothing capacitor (**C2**) which top off an operating voltage for said motor from a main alternating-current voltage; a regulating device (R) for controlling the rotational speed of said motor (UM); and a power stage of the regulating device (R) which includes a power switch (**TR1**) and a commutation diode (**D1**) and which controls the motor (UM); the improvement comprising:

(a) said power stage of the regulating device (R) including a high-setting inductor (L); and a circuit arrangement of a low-setting topology wherein electrical contacts (**K21**, **K22**) connect said motor (UM) and power switch (**TR1**) connected in series with said high-setting inductor (L) and for switching said power stage to a circuit arrangement of a high-setting topology having the high-setting inductor (L) and power switch (**TR1**) connected through said electrical contacts (**K21**, **K22**), in which a direct-current capacitor (**C1**) is connected in parallel with said motor (UM);

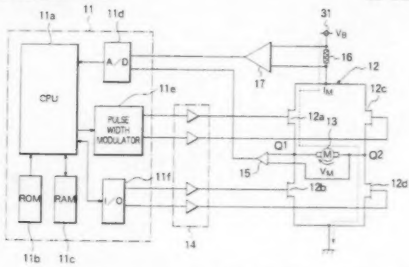
(b) and said direct-current capacitor (**C1**) is arranged in an intermediate circuit which is connected in parallel with the circuit arrangement of the low-setting topology and in parallel with the circuit arrangement of the high-setting topology.

6,016,042

METHOD OF DETECTING THE ANGLE OF ROTATION AND LOAD TORQUE OF A DC MOTOR, AND APPARATUS OF DETECTING THE ANGLE OF ROTATION AND LOAD TORQUE OF A DC MOTOR

Kazunori Miura, Hyogo; Masanori Takagi, Tokyo; Takayuki Kifuku, Tokyo, and Shigeki Ohtagaki, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1997, Appl. No. 869,213
Claims priority, application Japan, Jun. 10, 1996, 8-147531
Int. Cl.[7] H02P *1/04*
U.S. Cl. 318—430 **21 Claims**



1. A method of detecting the angle of rotation of a DC motor for driving a predetermined load, said method comprising the steps of:

driving said DC motor with a predetermined driving torque for a predetermined driving time period; and

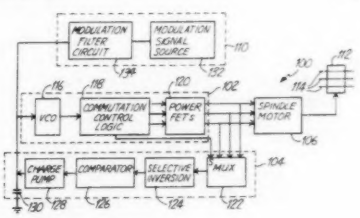
calculating the angle of rotation of said DC motor which occurs when the DC motor is driven based on the product of the driving time period and the voltage generated by said DC motor after the driving of said DC motor is stopped.

6,016,043

METHOD AND APPARATUS FOR CONTROLLING A MOTOR IN A DISC DRIVE BY MODULATING THE COMMUTATION ANGLE

Andrew R. Motzko, Burnsville; Garry E. Korbel, New Prague, both of Minn.; John M. Baker, Tuttle, and Stuart K. Francis, Oklahoma City, both of Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation-in-part of application No. 08/864,509, May 28, 1997, Provisional application No. 60/036,580, Jan. 29, 1997, Provisional application No. 60/063,228, Oct. 23, 1997. This application Jan. 28, 1998, Appl. No. 14,756.
Int. Cl.[7] G05B *1/02*
U.S. Cl. 318—606 **19 Claims**



1. A disc drive, comprising:

a rotatable disc;

a motor operably coupled to the disc to drive rotation of the disc; and

a motor control circuit for controlling the motor, the motor control circuit comprising:

a commutation circuit which provides commutation signals to the motor to commutate the motor at a commutation frequency; and

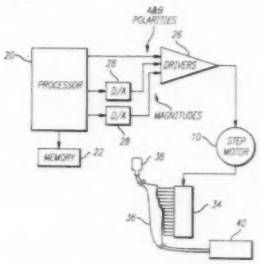
a frequency modulation circuit, operably coupled to the commutation circuit, which provides a modulation signal which frequency modulates the commutation frequency according to a predetermined pattern wherein the motor exhibits audible resonances at the commutation frequency and certain harmonics of the commutation frequency and wherein the modulation signal modulates the commutation frequency to spread a frequency spectrum associated with the commutation frequency to reduce the audible resonances at the commutation frequency and the certain harmonics.

6,016,044

OPEN-LOOP STEP MOTOR CONTROL SYSTEM

Charles R. Holdaway, San Diego, Calif., assignor to ALARIS Medical Systems, Inc., San Diego, Calif.

Filed Sep. 11, 1995, Appl. No. 526,468
Int. Cl.[7] H02P *8/22*
U.S. Cl. 318—696 **29 Claims**



1. A control system for controlling the movement of a motor, the system comprising:

an energy source providing an electrical current; and

a controller that controls the energy source to provide an exponentially increasing winding current to the motor to begin movement of the motor,

wherein the controller applies energy to the motor in a "one phase on" drive mode modified to microstep between the "one phase on" positions during movement of the motor, and wherein the controller controls the motor to accelerate by decreasing the number of microsteps per motor step while maintaining a constant microstep period.

21. A method of controlling movement of a step motor that moves in a series of motor steps, comprising the steps of:

(a) controlling the step motor to move through a first accelerating motor step in a first plurality of microsteps;

(b) controlling the step motor to move through a second accelerating motor step in a second plurality of microsteps, the second motor step being subsequent to the first motor step, wherein the second plurality of microsteps is less than the first plurality of microsteps.

27. In an intravenous delivery system comprising a fluid supply, a fluid supply line, and a fluid pump having a fluid pump step motor operating on the fluid supply line to move fluid through the line, a method for delivering fluid to a patient, comprising the steps of:

accelerating the fluid pump step motor in a series of motor steps, wherein a first of said motor steps is divided into a first number of microsteps, and a second of said motor steps is divided into a second number of microsteps, wherein the first number of microsteps is twice the second number of microsteps.

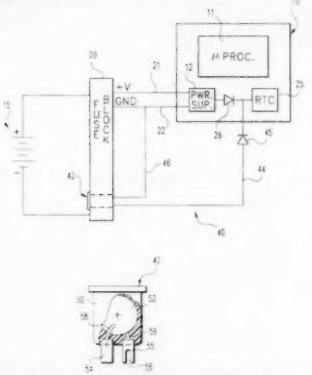
6,016,045
REAL-TIME CLOCK BACK-UP BATTERY

Mark G. Thomas; Ronald B. Lannan, and Kenneth R. Federle, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 3, 1999, Appl. No. 243,644

Int. Cl.[7] **H02J** *7/00;* **B60R** *16/04;* **B60L** *1/00*

U.S. Cl. 320—107 **31 Claims**



1. A battery back-up system for a real-time clock in a vehicle controller, in which power is normally provided to the real-time clock through a primary power circuit connected to the vehicle battery through a vehicle fuse block, the system comprising:

a fuse component having at least two conductive prongs configured for removable electrical engagement with a corresponding number of electrical contacts within the vehicle fuse block;

a back-up battery mounted within said fuse component in electrical connection with said conductive prongs; and

a back-up power circuit electrically connecting said corresponding number of electrical contacts within the fuse block to the real-time clock to provide power from the back-up battery to the clock.

6,016,046
BATTERY PACK

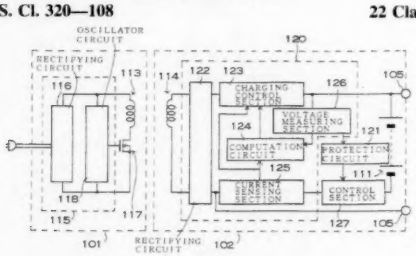
Osamu Kaite; Toshiharu Kokuga, both of Tsuna-gun, and Shoichi Toya, Mihara-gun, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jul. 17, 1998, Appl. No. 118,178

Claims priority, application Japan, Jul. 22, 1997, 9-195642; Jul. 23, 1997, 9-196658

Int. Cl.[7] **H01M** *10/46*

U.S. Cl. 320—108 **22 Claims**



1. A battery pack comprising:

at least one rechargeable battery;

a case containing the rechargeable battery;

a secondary coil which is housed in the case, is excited externally and outputs AC;

a control circuit which controls electric power induced in the secondary coil and charges the rechargeable battery contained in the case; and

a printed circuit board having the secondary coil attached to one side thereof and electronic parts which make up the control circuit attached to the other side thereof.

6,016,047
BATTERY MANAGEMENT SYSTEM AND BATTERY SIMULATOR

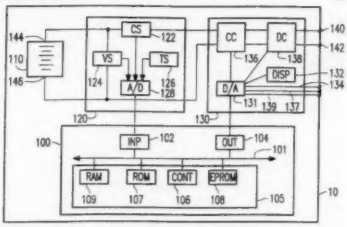
Petrus H.L. Notten; Hendrik J. Bergveld, and Wanda S. Kruijt, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1997, Appl. No. 968,376

Claims priority, application European Pat. Off., Nov. 21, 1996, 96203228

Int. Cl.[7] **H02J** *7/00*

U.S. Cl. 320—137 **15 Claims**



1. A battery management system comprising:

an input which receives input signals representative of a physical quantity of a battery; and a

processor which calculates at least one physical quantity of the battery at least partially based on the input signals and a battery temperature, and generates an output signal derived from the calculated physical quantity;

calculates the physical quantity based on an electrochemical/physical model of the battery; the model including at least one representation of a main electrochemical storage reaction;

calculates the battery temperature based on a temperature model of a temperature development in the battery and calculates the behaviour of the representation in dependence on the calculated battery temperature; and

derives the output signal at least partially from a state of the representation.

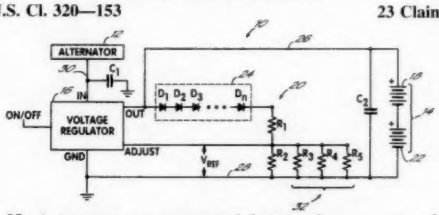
6,016,048
TEMPERATURE COMPENSATED BATTERY CHARGER SYSTEM

Chris R. Davidson, Grove, Okla., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Provisional application No. 60/051,543, Jul. 2, 1997. This application Jul. 2, 1998, Appl. No. 109,961.

Int. Cl.[7] **H01M** *10/44;10/46*

U.S. Cl. 320—153 **23 Claims**



22. A temperature compensated battery charger system for charging a battery, comprising:

a regulated voltage source;

an output circuit coupled to said regulated voltage source and adapted to be coupled to said battery for supplying a charging output voltage to said battery;

at least two diodes coupled to in said output circuit; and

a resistive element coupled in series with said diodes in said output circuit, wherein said resistive element and said diodes are collectively adapted to be connected in parallel with said battery, and further wherein said diodes are responsive to variations in temperature proximate said battery to vary said charging output voltage supplied to said battery.

6,016,049

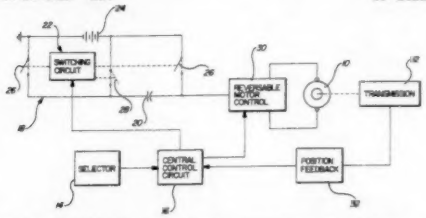
CAPACITIVE SUPERCHARGER FOR ELECTRIC SHIFT MECHANISM

James Baughman, Redford, and Douglas J. Wheeler, Farmington Hills, both of Mich., assignors to Teleflex Incorporated, Plymouth Meeting, Pa.

Filed Jun. 24, 1998, Appl. No. 103,747

Int. Cl.[7] **H02J** *7/00;* **B60K** *41/12;* **F16H** *59/00*

U.S. Cl. 320—167 **15 Claims**



1. An assembly for electrically controlling the shifting of a transmission (**12**) in an automotive vehicle, said assembly comprising;

an electric motor (**10**) for shifting the transmission (**12**) between park and various shift positions,

an operator controlled selector device (**14**) for selecting one of park and the various shift positions,

a central control circuit (**16**) for controlling the transmission of electrical signals from said selector device (**14**) to said electric motor (**10**) to actuate said motor (**10**),

said assembly characterized by a capacitor circuit (**18**) for storing electrical energy to actuate said motor (**10**) in response to signals from said central control circuit (**16**) when additional energy is required to shift the transmission (**12**) from park to another shift position.

6,016,050

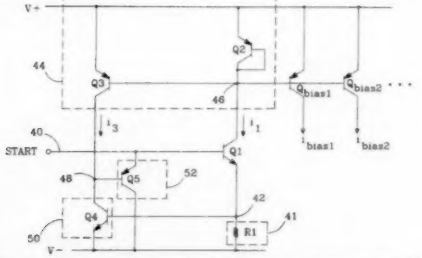
START-UP AND BIAS CIRCUIT

A. Paul Brokaw, Burlington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Jul. 7, 1998, Appl. No. 111,064

Int. Cl.[7] **G05F** *3/20;1/10;3/02*

U.S. Cl. 323—315 **30 Claims**



27. A voltage regulator which includes a start-up and bias circuit, comprising:

a voltage regulator, comprising:

a pass transistor connected between an input voltage terminal and an output voltage terminal which produces an output voltage at said output voltage terminal in accordance with a drive current received at its control input and an input voltage received at said input voltage terminal,

a drive circuit connected to supply said drive current to said pass transistor in accordance with an error voltage received at a first input and a bias current received at a second input,

a loop amplifier connected to supply said error voltage to said drive circuit in accordance with a feedback voltage received at a loop amplifier input, and

a feedback network connected between said output voltage terminal and said loop amplifier input and supplying said feedback voltage to said amplifier, said feedback network, loop amplifier and drive circuit forming a feedback loop that regulates said output voltage,

a start-up and bias circuit, comprising:

a first transistor connected to receive a start-up signal and to conduct a first current in response,

a mirror circuit connected to mirror said first current to produce a first mirrored current,

a second transistor connected to sink all of said mirrored current when said first current reaches a predetermined threshold, and

a third transistor having a current circuit connected to said start-up signal and conducting a current that varies with said current sunk by said second transistor, said third transistor thereby opposing increases in said start-up signal beyond that required to maintain said first current at said predetermined threshold,

said first current thereby becoming fixed at said predetermined threshold and providing a fixed bias point that is largely immune to variations in said start-up signal as long as said start-up signal is adequate to maintain said first current at said predetermined threshold, and

a fourth transistor connected to said fixed bias point to mirror said first current to said drive circuit, said current mirrored by said fourth transistor being said bias current.

6,016,051

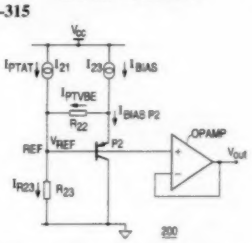
BANDGAP REFERENCE VOLTAGE CIRCUIT WITH PTAT CURRENT SOURCE

Sümer Can, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 30, 1998, Appl. No. 163,806

Int. Cl.[7] **G05F** *3/16*

U.S. Cl. 323—315 **24 Claims**



1. An apparatus including a bandgap reference circuit, the bandgap reference circuit comprising:

a proportional to absolute temperature (PTAT) current source that provides a PTAT current;

a bias current source that provides a bias current;

a transistor having a base, an emitter, and a collector, the base coupled to the IPTAT current source and the emitter coupled to the bias current source;

a first resistive circuit coupled between the emitter and the base of the transistor, the first resistive circuit configured to receive

a portion of the bias current and in accordance therewith provide a current proportional to a base-emitter voltage of the transistor; and

a second resistive circuit coupled to the base of the transistor and configured to receive the PTAT current and the current proportional to the base-emitter voltage of the transistor and in accordance therewith provide a reference voltage which remains substantially constant over temperature and which is proportional to a silicon bandgap voltage,

wherein the proportionality of the reference voltage to the silicon bandgap voltage is determined by a ratio of the first and second resistive circuits.

6,016,052

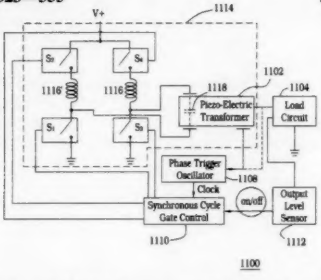
PULSE FREQUENCY MODULATION DRIVE CIRCUIT FOR PIEZOELECTRIC TRANSFORMER

Gary Vaughn, Albuquerque, N. Mex., assignor to CTS Corporation, Elkhart, Ind.

Filed Apr. 3, 1998, Appl. No. 54,634

Int. Cl.[7] H01F *17/00;* H01L *41/08*

U.S. Cl. 323—355 **30 Claims**



1. A single ended pulse frequency modulation drive circuit for a piezoelectric device, comprising:

a piezoelectric device having a resonate frequency and comprising a first input, a second input connected to ground, and an effective capacitance between the first input and the second input;

an inductor having a first end and a second end, the inductor resonating with the effective capacitance of the piezoelectric device at the resonate frequency of the piezoelectric device, wherein the first end of the inductor is coupled to the first input of the piezoelectric device;

a first switch coupled between ground and the first input of the piezoelectric device and operated by a periodic first signal at substantially a 50% duty factor of the resonate frequency of said piezoelectric device;

an oscillator coupled to said piezoelectric device and operating at substantially the resonant frequency of the piezoelectric device for providing an output signal, said periodic first signal generated in response to said output signal; and

a second switch coupled between the second end of the inductor and a DC power supply, said second switch closing and opening in response to a non-periodic second signal synchronized with the opening and closing action of said first switch, said second signal being generated in response to an asynchronous control signal such that the closing of said second switch gates an integral number of substantially half sinewave resonant waveforms having substantially zero switching volts across the input of the piezoelectric device.

6,016,053

GAS-INSULATED SWITCHGEAR WITH VOLTAGE TRANSFORMER AND OPTICAL MEASURING ELEMENT

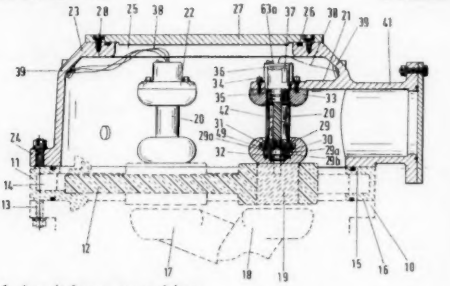
Christopher Yakymyshyn, Bozeman, Mont.; Michael Brubaker, Los Alamos, N. Mex.; Michael Schwarz, Freigericht, Germany; Alexis Mendez, Raleigh, N.C., and Dirk Ebbinghaus, Luenen, Germany, assignors to ABB Patent GmbH, Mannheim, Germany

Filed Aug. 26, 1997, Appl. No. 918,365

Claims priority, application Germany, Aug. 26, 1996, 196 34 251

Int. Cl.[7] G01R *31/00;19/00;* G01J *4/00*

U.S. Cl. 324—96 **8 Claims**



1. A switchgear, comprising:

a metal, gas insulated housing having a pot-shaped cap and a carrier arm;

an internal conductor connected to said housing;

a voltage transformer connected to said carrier arm and encapsulated by said housing, said voltage transformer having two ends and including:

a measuring element disposed in an electric field having field lines between said internal conductor and said housing, said measuring element including a Pockels crystal, a first deflection prism, a light input coupler, and two light output couplers, said Pockels crystal having two parallel walls running transversely with respect to the field lines of the electric field, one of said two parallel walls defining a high-voltage end and the other of said two parallel walls defining a low-voltage end, said first deflection prism disposed on said high voltage end for deflecting a light beam through 180°, said light input coupler for polarized light and said two light output couplers disposed on said low-voltage end;

a beam splitter disposed in a path of the light beam deflected from said first deflection prism for splitting the deflected light beam into a first partial beam and into a second partial beam;

a quarter-wave plate, a first analyzer, and a light output coupler disposed in a path of the first partial beam;

a second analyzer and a light output coupler disposed in a path of the second partial beam;

two shielding covers, one of said shielding covers disposed on one of said ends of said voltage transformer and another shielding cover disposed on another of said ends of said voltage transformer;

two transparent, electrically conductive layers for insuring that the field lines of the electric field run parallel to the light beam, one of said transparent, electrically conductive layers disposed on said high voltage end of said Pockels crystal, another one of said transparent, electrically conductive layers disposed on said low voltage end of said Pockels crystal;

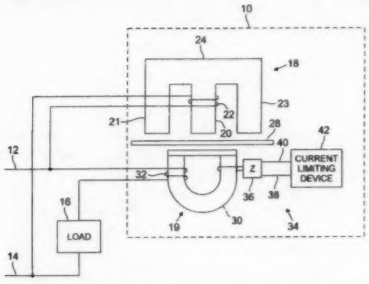
a tubular housing having said Pockels crystal disposed therein; and

at least two flexible rings elastically supporting said tubular housing within said shielding covers.

6,016,054
WATT HOUR METER REGISTRATION CALIBRATION METHOD AND APPARATUS

Byron J. Slater; John T. Voisine, and Gregory L. Dykstal, all of Lafayette, Ind., assignors to Siemens Transmission & Distribution, LLC, Wendell, N.C.

Filed Jul. 14, 1997, Appl. No. 892,484
Int. Cl.[7] G01R *19/00*
U.S. Cl. 324—142 **23 Claims**

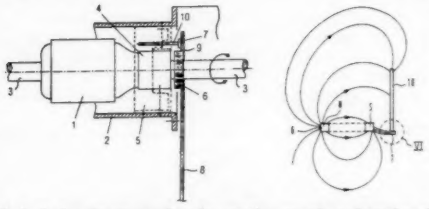


1. In an inductive drive meter for metering a facility having a load current, the inductive drive meter including a rotating disk and a current stator, a phase adjustment circuit comprising an impedance circuit having at least first and second terminals, at least one nonlinear device having at least first and second terminals connected, respectively, to the first and second terminals of the impedance circuit, said impedance circuit disposed in a flux inducing relationship with said current stator, wherein said phase adjustment circuit generates a compensation flux density based on whether the load current exceeds a predetermined threshold.

6,016,055
DEVICE FOR INCREASING THE MAGNETIC FLUX DENSITY IN THE VICINITY OF A HALL SENSOR COOPERATING WITH A MAGNET WHEEL

Heimo Jäger, Wr. Neudorf, and Werner Köstler, Vienna, both of Austria, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. PCT/DE96/00153, Feb. 1, 1996. This application Aug. 4, 1997, Appl. No. 906,183.
Claims priority, application Germany, Feb. 2, 1995, 195 03 376
Int. Cl.[7] G01P *3/52;* **G01B** *7/30*
U.S. Cl. 324—165 **5 Claims**



1. A device for measuring the rotation speed or detecting the direction of rotation of a rotary magnetic field, comprising:

a rotating rotor spindle;

a magnet wheel secured on said rotor spindle, said magnet wheel having a permanent magnet with magnet poles for generating a rotary magnetic field, said poles disposed in a radial plane perpendicular to said rotor spindle;

a printed circuit board disposed approximately perpendicular to said rotor spindle for receiving an electronic circuit;

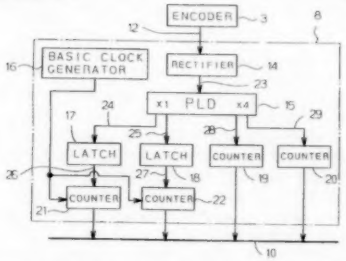
a Hall sensor secured as an integrated component on said printed circuit board, said Hall sensor having a sensor surface extended parallel to said printed circuit board; and

a magnetic flux guide element of high permeability disposed in the vicinity of said magnet wheel and substantially perpendicular to said sensor surface of said Hall sensor, for deflecting the magnetic field of said magnet wheel in an axial direction to increase magnetic flux density in the vicinity of said Hall sensor, said magnetic flux guide element extending in an axial direction along an imaginary longitudinal axis and disposed so that the axis passes through said surface of said Hall sensor.

6,016,056
MEASUREMENT OF DISPLACEMENT AND SPEED IN AN INJECTION MOLDING MACHINE

Mitsunori Seki, Aichi, Japan, assignor to Kabushiki Kaisha Meiki Seisakusho, Aichi-Ken, Japan

Filed Jan. 9, 1998, Appl. No. 4,859
Claims priority, application Japan, Jan. 14, 1997, 9-017478
Int. Cl.[7] G01P *3/52;13/00;* **B29C** *45/76*
U.S. Cl. 324—165 **10 Claims**



1. A device for an injection molding machine, the device detecting a displacement and a speed of a movable injection-molding part moved by an actuator (**31**) of the injection molding machine; the device comprising:

(a) an encoder (**3**), coupled to the injection-molding part and generating, upon a motion of the injection-molding part, two pulse waves (A,B) each having a common pulse frequency, the two pulse waves being out of phase by approximately a quarter cycle;

(b) a pulse treatment section (**14**,**15**), coupled to the encoder, producing subdivided trigger pulses (Gf, Gr) having a trigger pulse frequency being a multiple of the common pulse frequency;

(c) a basic clock generator producing basic clock pulses;

(d) a first counter (**19**,**20**), coupled to the pulse treatment section, counting the trigger pulses from the pulse treatment section;

(e) a latch (**17**,**18**), coupled to the pulse treatment section, latching the trigger pulses from the pulse treatment section;

(f) a second counter (**21**, **22**), coupled to the latch and the basic clock generator, counting the basic clock pulses during a latched interval between the trigger pulses;

(g) a controller coupled to the actuator and the encoder, the controller including

a speed calculator dividing a clock count from the second counter by the latched interval and comprising means to obtain a speed of the injection-molding part from a quotient thereof; and

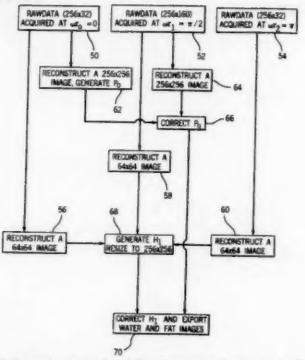
a displacement calculator comprising means to obtain a displacement of the injection-molding part from a trigger count of trigger pulses input to the displacement calculator from the first counter.

6,016,057

SYSTEM AND METHOD FOR IMPROVED WATER AND FAT SEPARATION USING A SET OF LOW RESOLUTION MR IMAGES

Jingfei Ma, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Apr. 17, 1998, Appl. No. 61,486
Int. Cl.[7] G01V *3/00*
U.S. Cl. 324—309 **33 Claims**



1. An MR imaging method for improved water and fat separation comprising the steps of:

obtaining at least three MR image data sets, two of the MR image data sets are obtained at a first image resolution, and a third is obtained at another image resolution, wherein at least one MR image data set is acquired at an image resolution higher than the image resolution of at least one other MR image data set and provides a regular matrix size image;

constructing three low-resolution images from the three MR image data sets; and

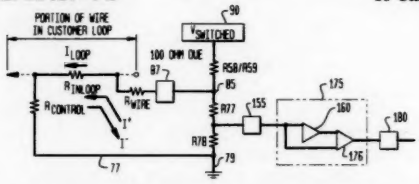
creating a low-resolution phase factor map from the three low-resolution images to correct phase errors in the regular matrix size image provided by the MR image data set obtained at the higher image resolution.

6,016,058

IN-SERVICE WIRING VERIFICATION CIRCUITRY

Robert Bradley Sussman, Middlesex; Carl Joseph Bilicska, Somerset, both of N.J., and Randolph Leonard Kasprzyk, Cook, Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 2, 1997, Appl. No. 942,526
Int. Cl.[7] G01R *31/02;* **H04M** *1/24*
U.S. Cl. 324—543 **16 Claims**



1. An in-circuit, wiring verification system for testing circuit wiring installed in an operational electrical circuit that is in use and having a first voltage source, said system comprising:

a) means for providing an isolated reference potential to a first location in said operational circuit;

b) a second voltage source for successively injecting first and second equal and opposite polarity currents into said operational circuit at a second location, said second voltage source providing voltage with reference to said isolated reference potential;

c) means for obtaining a first voltage produced by said first injected current and further obtaining a second voltage produced by said second equal and opposite polarity injected current;

d) means for generating a difference signal representing difference between said first voltage and said second voltage;

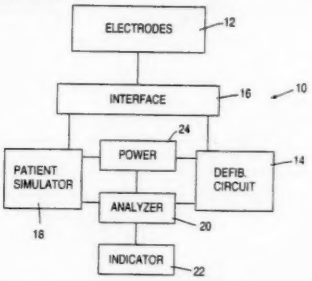
e) means for comparing said difference signal to predetermined threshold values and generating an output signal indicating continuity between said installed wiring and said operational circuit when said difference signal is between said predetermined threshold values.

6,016,059

DEFIBRILLATOR SYSTEM CONDITION INDICATOR

Carlton B. Morgan, Bainbridge Island, Wash., assignor to Heartstream, Inc., Seattle, Wash.

Division of application No. 08/063,631, May 18, 1993, abandoned. This application Jun. 6, 1995, Appl. No. 467,062.
Int. Cl.[7] G01R *27/26*
U.S. Cl. 324—556 **11 Claims**



1. A method for maintaining a defibrillator comprising the following steps:

periodically delivering a test pulse in a defibrillator from an energy source through conductors to a patient simulator within the defibrillator automatically without external activation;

analyzing a signal detected at the patient simulator to determine a condition of the defibrillator; and

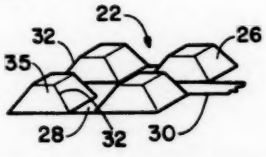
providing an indication of the condition of the defibrillator.

6,016,060

METHOD, APPARATUS AND SYSTEM FOR TESTING BUMPED SEMICONDUCTOR COMPONENTS

Salman Akram, Boise; Warren M. Farnworth, Nampa; Alan G. Wood, and David R. Hembree, both of Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Mar. 25, 1997, Appl. No. 823,490
Int. Cl.[7] G01R *1/067;31/26*
U.S. Cl. 324—757 **25 Claims**



1. An interconnect for a semiconductor component comprising:

a substrate; and

a contact member configured to electrically engage a contact bump on the component, the contact member comprising a plurality of electrically conductive projections on the substrate configured to retain the contact bump therebetween, each projection comprising a raised portion of the substrate at

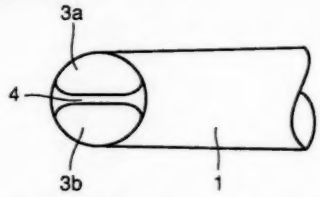
least partially covered with a non-bonding conductive layer, each projection comprising at least one edge configured to penetrate the contact bump and at least one face configured to electrically engage the contact bump.

6,016,061

CANTILEVER TYPE PROBE NEEDLE FOR PROBE CARD AND METHOD OF FABRICATION AND CONTROL THEREOF

Masaharu Mizuta, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1998, Appl. No. 13,921
Claims priority, application Japan, Jul. 24, 1997, 9-198500
Int. Cl.[7] H01B *1/02;5/02*
U.S. Cl. 324—762 **4 Claims**



1. A cantilever type probe needle for a probe card comprising:

a first convex portion at a leading end of the probe needle, and

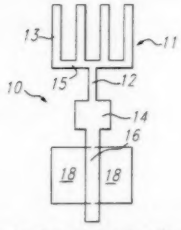
a second convex portion formed apart from said first convex portion at the leading end of the probe needle with a groove therebetween.

6,016,062

PROCESS RELATED DAMAGE MONITOR (PREDATOR)—SYSTEMATIC VARIATION OF ANTENNA PARAMETERS TO DETERMINE CHARGE DAMAGE

Paul Nicollian, Dallas, and Srikanth Krishnan, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/005,392, Oct. 13, 1995. This application Oct. 11, 1996, Appl. No. 729,477.
Int. Cl.[7] G01R *31/26*
U.S. Cl. 324—769 **10 Claims**



1. A test structure for determining the effect of various process steps on a plurality of devices with regards to charge-induced damage, said test structure comprising:

said plurality of devices, each of said devices includes a plurality of device levels and device structures;

a plurality of antennas for receiving charged particles emitted during a process step, each of said antennas connected to a corresponding portion of said plurality of devices and wherein said antenna and said corresponding portion of said plurality of devices has a perimeter ratio and an antenna ratio; and

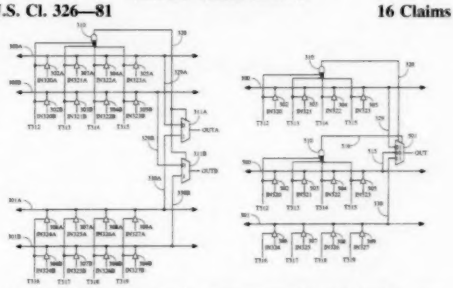
wherein said perimeter ratios and said antenna ratios are substantially different for different portions of said plurality of antennas and their corresponding portion of said plurality of devices so that the effect of said various process steps with regards to charge-induced damage can be determined.

6,016,063

METHOD AND APPARATUS FOR CONNECTING LONG LINES TO FORM WIDE LOGIC FUNCTIONS

Stephen M. Trimberger, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Feb. 4, 1998, Appl. No. 18,281
Int. Cl.[7] H03K *19/0175*
U.S. Cl. 326—81 **16 Claims**



1. A circuit implemented in a programmable logic device, comprising:

an array of configurable logic blocks (CLBs);

an array of lines distributed across said circuit and comprising a first line and a second line, each of said first and second lines being configured to be resistively coupled to a voltage supply;

an array of tristate buffers distributed about said circuit to couple each of said CLBs to an adjacent line, said array of tristate buffers comprising a first plurality of tristate buffers and a second plurality of tristate buffers, said first plurality of tristate buffers being configured to have open-drain interconnections with said first line, said second plurality of tristate buffers being configured to have open-drain interconnections with said second line; and

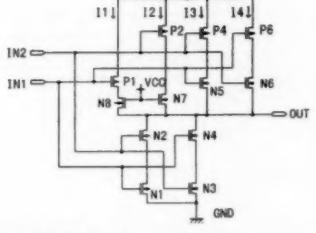
means for combining a first input signal and a second input signal to form a combined logic function, said first input signal being provided by said first line and said second input signal being provided by said second line.

6,016,064

INTERPOLATING CIRCUIT

Takanori Saeki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 12, 1998, Appl. No. 38,971
Claims priority, application Japan, Mar. 13, 1997, 9-058749
Int. Cl.[7] H03K *19/094;19/0175;19/01*
U.S. Cl. 326—121 **9 Claims**



1. An interpolating circuit comprising:

a parallel-connected element having a plurality of MOS transistors of a first conductivity type, one of the terminals of said transistors being connected to a first power supply, the other terminal of said transistors being connected to an output terminal, and the gates of said transistors being connected to mutually different input terminals, respectively, and,

a first series-connected element having a plurality of MOS transistor of a second conductivity type, one of the terminals

of said transistors being connected to a second power supply, the other terminals of said transistor being connected to said output terminal, and the gates of said transistors being connected respectively to said input terminals,

one or more separate series-connected elements each having a plurality of MOS transistor, one of the ends of which is connected to said first power supply, the other ends of which is connected to the above-noted output terminal, and the gates of each one of said MOS transistors is connected respectively to the above-noted input terminals.

6,016,065

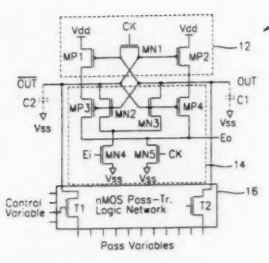
CHARGES RECYCLING DIFFERENTIAL LOGIC(CRDL) CIRCUIT AND STORAGE ELEMENTS AND DEVICES USING THE SAME

Bai-Sun Kong, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Division of application No. 08/775,951, Jan. 3, 1997, Provisional application No. 60/022,565, Jul. 24, 1996. This application Jan. 21, 1999, Appl. No. 234,517.

Int. Cl.[7] H03K *19/096*

U.S. Cl. 326—121 **13 Claims**



1. A semiconductor device comprising:

a) a logic circuit having

i) first and second output nodes,

ii) a pair of cross-coupled first and second transistors coupled to said first and second output nodes,

iii) a third transistor coupled to said first and second transistors, said third transistor equalizing said first and second output nodes to potentials which are about equal to one another,

iv) a sense amplifier to accelerate a potential pull-down transition of said first and second output nodes, and

v) means for generating an enable output signal; and

b) a latch circuit having an input electrode coupled to one of said first and second output nodes of said logic circuit, a control input electrode coupled for receiving said enable output signal, and an output electrode for providing one of an output signal and an inverted signal of the output signal.

6,016,066

METHOD AND APPARATUS FOR GLITCH PROTECTION FOR INPUT BUFFERS IN A SOURCE-SYNCHRONOUS ENVIRONMENT

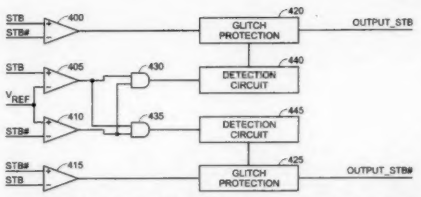
Alper Ilkbahar, Santa Cruz, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 19, 1998, Appl. No. 45,167

Int. Cl.[7] H03K *5/22*

U.S. Cl. 327—23 **20 Claims**

1. A method comprising:



receiving a pair of strobe signals from a source synchronous component via an externally terminated bus;

latching the pair of strobe signals for a first predetermined period of time in response to state transitions;

determining whether both of the strobe signals are of equivalent logic state; and

continuing to latch the strobe signals in response to both strobe signals being of equivalent logic state.

6,016,067

SAMPLE-AND-HOLD CIRCUIT HAVING REDUCED AMPLIFIER OFFSET EFFECTS AND RELATED METHODS

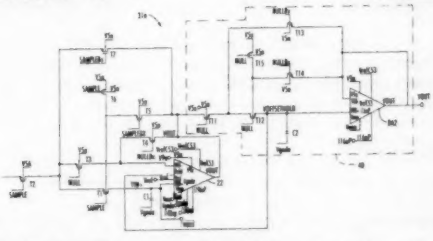
Salomon Vulih, Neshamic Station; Donald R. Preslar, Somerville, both of N.J., and Thomas A. Jochum, Durham, N.C., assignors to Intersil Corporation, Palm Bay, Fla.

Filed Apr. 6, 1998, Appl. No. 55,562

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H03K *17/00;* **G11C** *27/02*

U.S. Cl. 327—94 **48 Claims**



1. An integrated sample-and-hold (S/H) circuit for an input signal and comprising:

a substrate;

a first sampling capacitor formed on said substrate;

a first field-effect transistor (FET) formed on said substrate and having a first conduction terminal for receiving the input signal, a second conduction terminal connected to said first sampling capacitor, and a control terminal responsive to control signals for connecting the input signal to said first sampling capacitor during a sampling time and for disconnecting the input signal from said first sampling capacitor during a holding time, said first FET further comprising a body creating a parasitic diode-connected to said first sampling capacitor;

a first buffer amplifier having an input connected to said first sampling capacitor and an output connected to the body of said first FET during the holding time for applying a holding voltage from said first sampling capacitor to the body of said first FET to thereby reduce undesired effects from the parasitic diode, said first buffer amplifier having a direct current (D.C.) offset; and

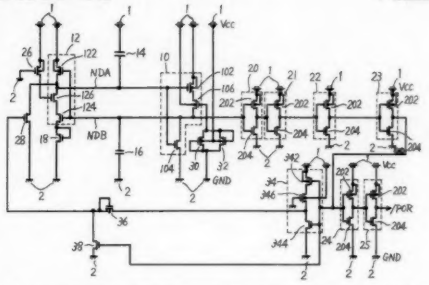
amplifier offset compensation means for compensating for the D.C. offset of said first buffer amplifier.

6,016,068

POWER ON RESET CIRCUIT CAPABLE OF GENERATING POWER ON RESET SIGNAL WITHOUT FAIL

Lei Ding, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1998, Appl. No. 35,922
Claims priority, application Japan, Sep. 9, 1997, 9-243648
Int. Cl.[7] H03L *7/00*
U.S. Cl. 327—142 **7 Claims**



1. A power on reset circuit generating a power on reset signal for a prescribed time period after power supply is turned on, comprising:

a first CMOS inverter circuit;

a second CMOS inverter circuit having an input node connected to an output node of said first CMOS inverter circuit and an output node connected to an input node of said first CMOS inverter circuit;

a capacitor connected between a power supply node and the input node of said first CMOS inverter circuit;

voltage boosting means for boosting a source voltage of an N channel MOS transistor in said second CMOS inverter circuit by a prescribed voltage from ground voltage; and

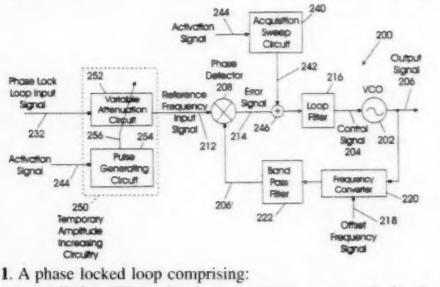
a buffer circuit responsive to a voltage of the output node of said first CMOS inverter circuit for generating said power on reset signal.

6,016,069

ATTENUATING SYSTEMS AND METHODS FOR ACQUIRING SYNCHRONIZATION IN PHASE LOCKED LOOPS

Bogdan Sadowski, Apex, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Feb. 10, 1998, Appl. No. 21,668
Int. Cl.[7] H03L *7/00;7/093*
U.S. Cl. 327—156 **19 Claims**



1. A phase locked loop comprising:

a controlled oscillator that is responsive to a control signal to generate an output signal;

a phase detector that is responsive to a reference frequency input signal and to the output signal to produce an error signal;

a loop filter that filters the error signal to thereby produce the control signal;

an acquisition sweep circuit that is responsive to an activation signal to sweep the control signal and thereby acquire lock in the phase locked loop; and

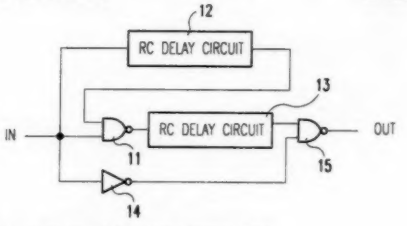
a variable attenuation circuit that is coupled between a phase locked loop input signal and the reference frequency input signal and that is also responsive to the activation signal, to attenuate the phase locked loop input signal after the sweep of the control signal.

6,016,070

PULSE EXTENDING CIRCUIT

Hidenori Uehara, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1996, Appl. No. 743,363
Claims priority, application Japan, Jun. 28, 1996, 8-169904
Int. Cl.[7] H03K *5/00;3/017*
U.S. Cl. 327—176 **12 Claims**



1. A pulse extending circuit comprising:

an input terminal receiving an input signal;

a first delay circuit having an input coupled to said input terminal and receiving said input signal, and having an output providing a delayed input signal;

a first NAND circuit having a first input terminal coupled to said output of said first delay circuit and receiving said delayed input signal, a second input terminal coupled to said input terminal and receiving said input signal, and an output providing a first NAND output signal;

a second delay circuit having an input coupled to said output of said first NAND circuit and receiving said first NAND output signal and having an output providing a delayed first NAND output signal;

a first inverter having an input coupled to said input terminal and receiving said input signal, and having an output providing an inverted input signal; and

a second NAND circuit having a first input terminal coupled to said output of said second delay circuit and receiving said delayed first NAND output signal, and having a second input terminal coupled to said output of said first inverter and receiving said inverted input signal.

6,016,071

INTERNAL SOURCE CLOCK GENERATION CIRCUIT FOR USE WITH POWER MANAGEMENT SCHEME

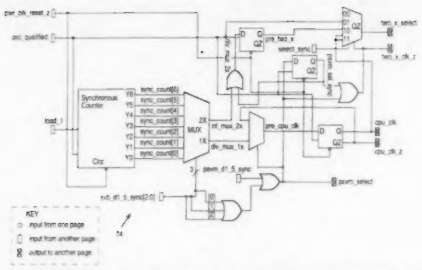
Michael John Shay, Arlington, Tex., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of application No. 08/451,206, May 26, 1995, Pat. No. 5,805,923. This application Jun. 25, 1998, Appl. No. 104,888.
Int. Cl.[7] H03K *5/13*
U.S. Cl. 327—294 **13 Claims**

1. A switchable internal source clock generation circuit for use in a power management system to provide a system clock signal, comprising:

synchronous counter circuitry with a synchronous load input and an asynchronous clear input, the synchronous counter circuitry configured to provide, at an output, a count output clock signal;

multiplexer circuitry having a first input and a second input; and



flip-flop circuitry having an input coupled to the output of the multiplexer circuitry, and an output, wherein the output of the flip-flop circuitry is sampled responsive to a reference clock signal and is provided as the system clock signal, wherein the reference clock signal is referenced to an external oscillator clock,

wherein:

the first input of the multiplexer circuitry is coupled to receive the count output clock signal and the second input of the multiplexer is coupled to the output of the flip-flop circuitry; and

the multiplexer circuitry includes selection circuitry that selects, to provide to the output of the multiplexer circuitry and responsive to a state of a selection control signal, one of the output of the flip-flop circuitry, such that the system clock signal has a first frequency, and the count output clock signal, such that the system clock signal has a second frequency.

6,016,072

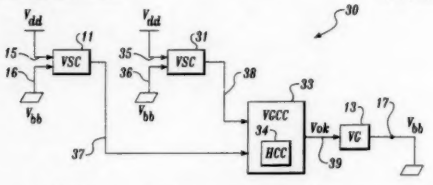
REGULATOR SYSTEM FOR AN ON-CHIP SUPPLY VOLTAGE GENERATOR

Luigi Ternullo, Jr., and Michael C. Stephens, both of San Jose, Calif., assignors to Vanguard International Semiconductor Corporation, Taiwan

Filed Mar. 23, 1998, Appl. No. 46,408

Int. Cl.[7] G05F *1/10*

U.S. Cl. 327—535 **29 Claims**



1. A circuit for activating an on-chip voltage generator, the on-chip voltage generator configured to generate an on-chip supply voltage, the circuit comprising:

a first voltage sense circuit configured to monitor the on-chip supply voltage, wherein the first voltage sense circuit is configured to detect an occurrence of the on-chip supply voltage being substantially equal to a first threshold;

a second voltage sense circuit configured to monitor the on-chip supply voltage, wherein the second voltage sense circuit is configured to detect an occurrence of the on-chip supply voltage being substantially equal to a second threshold, the second threshold having a value different from the value of the first threshold; and

a logic circuit coupled to the on-chip voltage generator and the first and second voltage sense circuits, wherein the logic circuit is configured to selectively activate and de-activate the on-chip voltage generator so as to maintain the on-chip supply voltage within a range defined by the first and second thresholds so that in normal operation all transitions between activation and de-activation of the on-chip voltage generator are in response to a detection of an occurrence of the first or second threshold,

wherein said all transitions occur between the detections of said first and second thresholds.

6,016,073

BICMOS NEGATIVE CHARGE PUMP

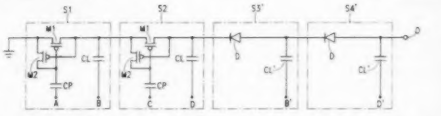
Andrea Ghilardelli, Cinisello Balsamo; Jacopo Mulatti, Latisana, and Maurizio Branchetti, San Polo D'Enza, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Nov. 5, 1997, Appl. No. 965,068

Claims priority, application European Pat. Off., Nov. 14, 1996, 96830581

Int. Cl.[7] G06F *1/10*

U.S. Cl. 327—536 **34 Claims**



1. Charge pump comprising a plurality of stages connected in series between a reference potential and an output terminal of the charge pump, wherein said plurality of stages comprises a first group of stages, proximate to said reference potential, and a second group of stages proximate to said output terminal of the charge pump, each stage of said first group comprising a pass-transistor with first and second terminals respectively connected to an input and an output of the stage, and a first capacitor with a first plate connected to said output of the stage and a second plate driven by a first digital signal switching between said reference voltage and a positive voltage, each stage of the second group comprising a junction diode having a first electrode connected to an input of the stage and a second electrode connected to an output of the stage, wherein the junction diode transfers charge from an input of the stage for an entire period of the first digital signal to an output of the stage, and a second capacitor having a first plate connected to said output of the stage and a second plate driven by a second digital signal switching between said reference voltage and said voltage supply.

6,016,074

PROGRAMMABLE REFERENCE VOLTAGE CIRCUIT

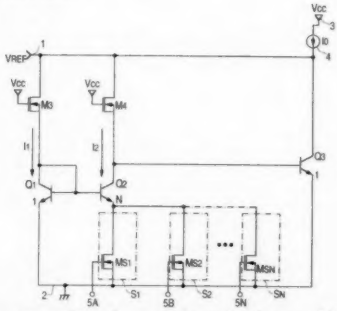
Manabu Yamamori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 30, 1997, Appl. No. 941,365

Claims priority, application Japan, Sep. 30, 1996, 8-257252

Int. Cl.[7] G05F *3/02*

U.S. Cl. 327—541 **1 Claim**



1. A programmable reference voltage circuit comprising:

a reference voltage output terminal from which a reference voltage is outputted;

a ground terminal kept to have a ground potential;

a power terminal from which a power is supplied to said programmable reference voltage circuit, and said power terminal being connected through a current source to said reference voltage output terminal;

a first bipolar transistor having a collector connected through a first resistive element having a first resistance to said reference voltage output terminal, a base connected to said collector, and an emitter connected to said ground terminal;

a second bipolar transistor having a collector connected through a second resistive element having a second resistance to said reference voltage output terminal, a base connected to said base of said first bipolar transistor, and an emitter connected through a resistive element selecting circuit to said ground terminal;

a third bipolar transistor having a collector connected to said reference voltage output terminal, a base connected to said collector of said second bipolar transistor and an emitter connected to said ground terminal; and

MOS field effect transistors being provided between said emitters of said first and third bipolar transistors and said ground terminal, and said MOS field effect transistors being kept in operation in saturation state and having predetermined ON-resistances,

wherein said resistive element selecting circuit includes a plurality of selectable resistive elements having different resistances from each other and said selectable resistive elements are connected between said emitter and said ground terminal in parallel to each other, and

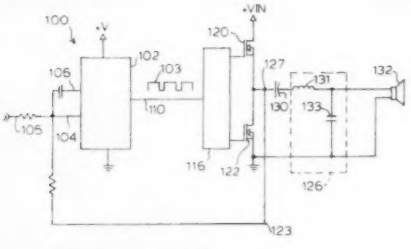
wherein said resistive elements selecting circuit is capable of selecting any one of said selectable resistive elements so that said emitter of said second bipolar transistor is connected through said selected one of said selectable resistive elements to said ground terminal, whereby said programmable reference voltage circuit is capable of varying said reference voltage in accordance with said different resistances of said selectable resistive elements.

6,016,075

CLASS-D AMPLIFIER INPUT STRUCTURE

David J. Hamo, Cary, N.C., assignor to Lord Corporation, Cary, N.C.

Filed Jun. 4, 1997, Appl. No. 869,104
Int. Cl.[7] H03F *3/38*
U.S. Cl. 330—10 **17 Claims**



1. An audio amplifier comprising:

(a) a first section having at least one audio signal input port to which a respective audio input signal to be amplified is applied;

(b) a second section having a first monolithic device forming an integrated circuit coupled to said respective audio input port to receive said respective audio input signal, coupled to at least one feedback network to receive a respective feedback signal from the respective output of said audio amplifier, and adapted to produce at least one Pulse Width Modulated square wave signal;

(c) a third section embodied in a second monolithic device forming a second integrated circuit having:

(i) at least one Pulse Width Modulated square wave signal input port;

(ii) at least two square wave signal output ports;

(iii) at least two field effect transistor (FET) driver circuits connected to said respective Pulse Width Modulated square wave signal input port to receive a respective Pulse Width Modulated square wave signal and develop therefrom a respective square wave FET switching signal directed to a respective said square wave signal output port;

(d) a fourth section having at least one FET operated switching circuit with at least two FETs wherein each of said FETs is connected to a corresponding respective square wave signal output port, each said respective FET being operative in response to a respective said square wave FET switching signal being received on the respective said square wave signal output to which said respective FET connected to switch sequentially and produce therefrom as an output of each said respective FET operated switching circuit a respective amplified square wave signal; said fourth section being adapted for use in conjunction with a proscribed number of external power sources;

(e) a fifth section having:

(i) at least one filter circuit connected to receive and filter said respective amplified square wave signal, and produce therefrom a respective continuous amplified audio signal;

(ii) at least one audio speaker connected to receive said respective continuous amplified audio signal and produce a respective audible signal therefrom;

(f) said respective feedback network is coupled to said respective filter circuit and said respective audio input port for transmitting said respective feedback signal in which the formation of said respective Pulse Width Modulated square wave signal depends; and

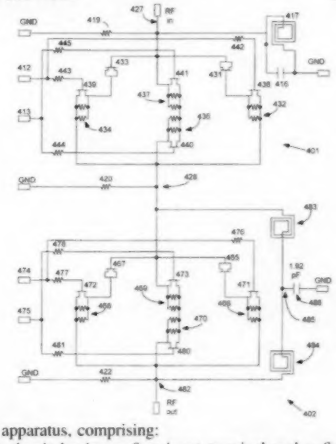
wherein said first and second sections and the components thereof are embodied in a single integrated circuit adapted on its input side to receive said respective audio input signal and said respective feedback signal, and on its output side having connections to said respective FET switching circuit.

6,016,076

METHOD AND APPARATUS FOR MICROWAVE PREDISTORTER LINEARIZER WITH ELECTRONIC TUNING

Thomas William Arell, Harvard, Mass., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 5, 1998, Appl. No. 92,323
Int. Cl.[7] H03F *1/26*
U.S. Cl. 330—149 **10 Claims**



1. An apparatus, comprising:

a first circuit having a first input terminal and a first output terminal, the first circuit including first, second and third branches coupled in electrical parallel between the first input

and output terminals, the first branch having a first diode and a first variable load coupled in electrical series, the second branch having a second diode and a second variable load coupled in electrical series, and the third branch having a third variable load coupled in electrical series; and

a second circuit having a second input terminal, a second output terminal and a low pass filter coupled between the second input terminal and the second output terminal, the second circuit including fourth, fifth and sixth branches colipled in electrical parallel between the second input and output terminals, the fourth branch having a third diode and a fourth variable load coupled in electrical series, the fifth branch having a fourth diode and fifth variable load coupled in electrical series, and the sixth branch having a sixth variable load coupled in electrical series, the first output terminal being coupled to the second input terminal.

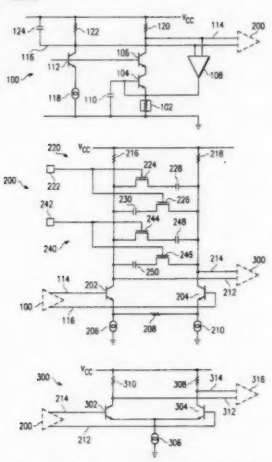
6,016,077
SYSTEM FOR USER PROGRAMMABLE BANDWIDTH OF AMPLIFIER CIRCUITRY

Indumini W. Ranmuthu, Plano, and Glenn C. Mayfield, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/080,994, Apr. 7, 1998. This application Nov. 24, 1998, Appl. No. 199,117.

Int. Cl.[7] **H03F** *3/45;1/14;3/16*

U.S. Cl. 330—252 **13 Claims**



1. Circuitry for amplifying electrical signals comprising:

input circuitry adapted to receive an electrical signal;

an amplification circuit for amplifying said electrical signal coupled to said input circuitry, and adapted to output an amplified electrical signal;

a user switchable circuit coupled to said amplification circuit, and adapted to selectively modify a capacitive load within said amplification circuit;

a switch input;

a switching element responsively coupled to said switch input; and

a capacitive element operatively coupled to said switching element and to said amplification circuit;

wherein said switching element is a MOSFET, said capacitive element is a capacitor, the gate of said MOSFET is coupled to said switch input, the MOSFET is operatively coupled between a first side of said differential amplifier and said capacitor, and said capacitor is operatively coupled between said MOSFET and a second side of said differential amplifier.

6,016,078
LOW OFFSET OUTPUT STAGE FOR PRECISION COMPARATORS

Davide Giacomini, Valdengo, Italy, assignor to STMicroelectronics S.r.l., Agrate Brianza, Italy

Filed Sep. 14, 1998, Appl. No. 152,846

Claims priority, application Italy, Sep. 25, 1997, VA97A0031

Int. Cl.[7] **H03F** *3/45*

U.S. Cl. 330—253 **3 Claims**

1. A MOS technology integrated multistage differential single ended amplifier circuit comprising an input circuit composed of two differential input stages (**M8**, **M9**, **M14**, **M15**, **M10**, **M11**, **M12**, **M13**, **M4**, **M5**, **M6**, **M7**) of complementary symmetry provided with biasing means (**M20**, **M19**, **M2**, **M3**, **M21**) including two complementary current generators (**M3**, **M21**), referred to the supply voltage and to ground potential, respectively, and having two lines of differential output (diffA, diffB), and an output circuit (**M5**, **M6**, **M67**, **M68**, **M19**, **M64**, **M69**, **M71**) comprising a current mirror circuit (**M5**, **M6**) on the two branches of which are injected currents (**Ia2**, **Ib2**), each corresponding to the difference between a bias current generated by a respective current generator (**M19**, **M64**) and a respective differential current (**Ia1**, **Ib1**) output by said input circuit, through said output lines (diffA, diffB), characterized in that said output circuit further comprises:

two diode-connected MOS transistors (**M18**, **M65**), referred to ground potential and forming respective current mirrors with said current generators (**M19**, **M64**) of said current mirror circuit, also referred to ground potential, through which said output currents (**Ia1**, **Ib1**) are respectively forced, mirroring said output currents (**Ia1**, **Ib1**) on said current generators (**M19**, **M64**) respectively, with a certain mirroring ratio, and permitting an increase of the signal currents (**Ia2**, **Ib2**) through said current mirror circuit (**M5**, **M6**) without any increase of said currents (**Ia1**, **Ib1**) output by said differential input stages;

the injection nodes of said output currents (**Ia1**, **Ib1**) of said input stages on said diode-connected MOS transistors (**M18**, **M65**) been coupled to the gates of two MOS transistors (**M69**, **M70**), respectively, referred to ground potential, that provide a voltage reference to a single load S transistor (**M71**) of said current mirror circuit.

6,016,079
POWER AMPLIFIER DEVICE

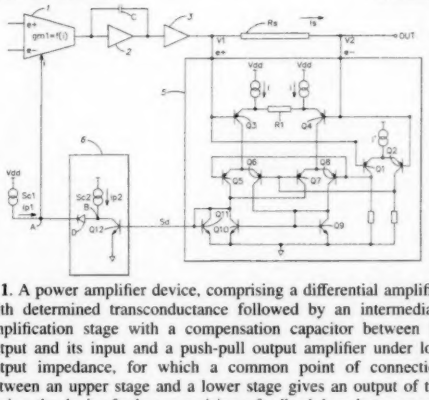
Marius Reffay, Grenoble, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Jan. 30, 1998, Appl. No. 16,606

Claims priority, application France, Feb. 14, 1997, 97 01758

Int. Cl.[7] **H03F** *3/45;1/14*

U.S. Cl. 330—255 **35 Claims**



1. A power amplifier device, comprising a differential amplifier with determined transconductance followed by an intermediate amplification stage with a compensation capacitor between its output and its input and a push-pull output amplifier under low output impedance, for which a common point of connection between an upper stage and a lower stage gives an output of the device, the device further comprising a feedback loop between said output and a biasing node for biasing differential inputs of the differential amplifier and receiving a determined biasing current to

temporarily increase the transconductance of said differential amplifier at the passage of the conduction from one stage to the other stage of the push-pull amplifier.

6,016,080

COMPUTER BASED FAST PHASE DIFFERENCE MEASURING UNIT AND PLL USING SAME

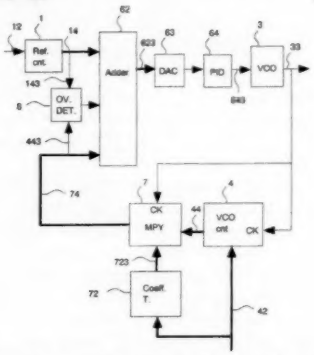
Marc Zuta, and Idan Zuta, both of 19 Ben Yehuda Street, Petah Tikva, Israel, 49373

Continuation-in-part of application No. 09/201,165, Nov. 30, 1998, which is a continuation of application No. PCT/IL98/00152, Mar. 30, 1998. This application May 18, 1999, Appl. No. 313,175.

Claims priority, application Israel, Mar. 30, 1997, 120552

Int. Cl.[7] **G01R** *25/00;* **H03L** *7/085*

U.S. Cl. 331—25 **20 Claims**



1. A system for measuring a phase difference between two input signals, comprising computer means performing computations in the complex domain and operating on two complex signals indicative of the two input signals respectively to compute the phase difference.

6,016,081

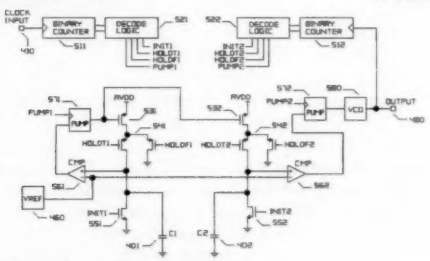
TUNABLE OSCILLATOR USING A REFERENCE INPUT FREQUENCY

Timothy G. O'Shaughnessy, 7425 Woodmen Rd., CO SPGS, Colo. 80908

Filed Jul. 17, 1998, Appl. No. 118,215

Int. Cl.[7] **H03B** *5/00;5/32*

U.S. Cl. 331—48 **45 Claims**



1. A tunable oscillator comprising:

an input for receiving an input signal having an input frequency;

an output for providing an output signal having an output frequency;

a first capacitor;

a second capacitor;

a frequency to current converter having a first terminal connected to the input for receiving an input signal and a second terminal connected to said first capacitor; and

a current to frequency converter responsive to the current of the frequency to current converter, having a first terminal connected to said second capacitor, and an output terminal connected to said output for providing an output signal.

6,016,082

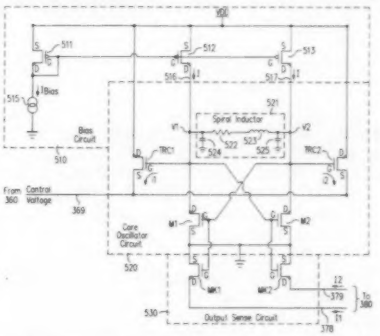
LOW PHASE NOISE LC OSCILLATOR FOR MICROPROCESSOR CLOCK DISTRIBUTION

Jose M. Cruz, Palo Alto; Robert J. Bosnyak, San Jose, and Robert J. Drost, Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Feb. 13, 1998, Appl. No. 23,360

Int. Cl.[7] **H03B** *5/12;5/18;* **H03L** *7/099*

U.S. Cl. 331—117 FE **29 Claims**



1. An oscillator circuit comprising:

a bias circuit having a first bias circuit output line and a second bias circuit output line;

a CMOS core oscillator circuit having:

a spiral inductor connected between the first and second bias circuit output lines;

a first voltage controlled capacitor having a first lead connected to the first bias circuit output line; and

a second voltage controlled capacitor having a first lead connected to the second bias circuit output line; and

an output sense circuit having:

a first sense circuit input line connected to the second bias circuit output line;

a second sense circuit input line connected to the first bias circuit output line;

a first sense circuit output line; and

a second sense circuit output line.

6,016,083

ELECTRONIC CIRCUIT APPARATUS FOR SUPPRESSING ELECTROMAGNETIC RADIATION

Shunji Satoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1997, Appl. No. 919,431

Claims priority, application Japan, Aug. 27, 1996, 8-224286

Int. Cl.[7] **H04B** *3/28*

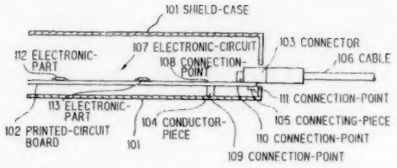
U.S. Cl. 333—12 **6 Claims**

1. An electronic circuit apparatus for suppressing electromagnetic radiation comprising:

an electronic circuit mounted on a top surface of a printed-circuit board;

an input-output terminal mounted on said printed-circuit board;

a shield-case for suppressing electromagnetic radiation from said electronic circuit;



a conductor-piece, allocated between said electronic circuit and said input-output terminal and, connecting a first ground-pattern stuck to a bottom surface of said printed-circuit with said shield-case;

means for connecting said first ground-pattern with said input-output terminal via said conductor-piece;

wherein said connecting means is composed of a second ground-pattern stuck to said bottom surface of said printed-circuit board near said input-output terminal and a metallic-connecting-piece for connecting said second ground-pattern with said shield-case.

6,016,084

METHOD FOR CONNECTING PRINTED CIRCUIT BOARD WITH HOUSING, AND ELECTRONIC INSTRUMENT HAVING CONNECTION STRUCTURE ACCORDING TO THE CONNECTING METHOD

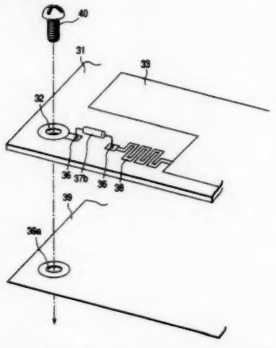
Satoshi Sugimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1997, Appl. No. 994,563

Claims priority, application Japan, Dec. 27, 1996, 8-349523; Feb. 25, 1997, 9-040514

Int. Cl.[7] H03H *7/01*

U.S. Cl. 333—12 **21 Claims**



1. A connection structure between a printed circuit board of an electronic instrument and a housing of the instrument, comprising:

a conductive part of the housing of the instrument as a housing ground;

a printed circuit board having a ground pattern, said ground pattern of the printed circuit board being separated into a ground pattern for signal and a ground pattern for connection with said conductive part of the housing of the instrument;

a connecting member for electrically connecting said conductive part of the housing of the instrument with the ground pattern for connection; and

a component permitting an impedance thereof to be set, said component being connected between said ground pattern for signal and said ground pattern for connection, said component suppressing radiant noise, wherein

said component comprises components having at least two of inductive nature, capacitive nature, and resistive nature and connected in series.

6,016,085

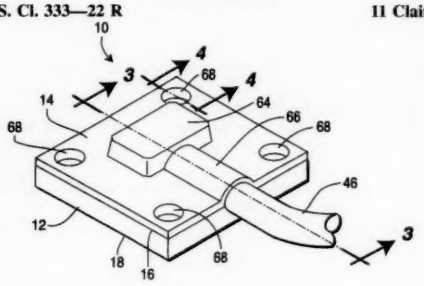
FLAT CABLE LOAD

Joseph B. Mazzochette, Cherry Hill, N.J., assignor to EMC Technology LLC, Cherry Hill, N.J.

Filed Sep. 28, 1998, Appl. No. 161,766

Int. Cl.[7] H01P *1/26*

U.S. Cl. 333—22 R **11 Claims**



1. An RF. termination load comprising:

a substantially flat base of an electrically and thermally conductive material having first and second surfaces, a recess in said first surface and a groove in the first surface extending from the recess to an edge of the base;

a resistor seated in the recess in the first surface of the base, said resistor comprising a substrate of an electrically insulating material having first and second opposed surfaces, a resistance film on said first surface, a first contact of a conductive material on said first surface at one end of the resistance film and a second contact of a conductive material on said first surface and extending from the other end of the resistance film over an edge of the substrate and along the second surface of the substrate, said resistor being seated in the recess with the portion of the second contact which is on the second surface of the substrate being seated on and contacting the base; and

an RF cable having an inner conductor and an outer shielding conductor spaced and insulated from the inner conductor, the cable having an end which is seated in the groove in the first surface of the base with the inner conductor being electrically connected to the first contact of the resistor and the outer shielding conductor being electrically connected to the base.

6,016,086

NOISE CANCELLATION MODIFICATION TO NON-CONTACT BUS

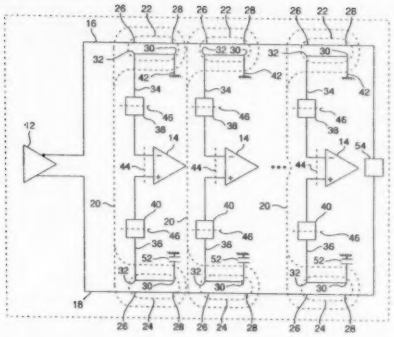
John M. Williamson, Stittsville; Alexandre J. Guterman, Nepean; Robert Zani, Stittsville; Terry Newell, and Anthony K. Dale Brown, both of Kanata, all of Canada, assignors to Nortel Networks Corporation, Montreal, Canada

Filed Apr. 3, 1998, Appl. No. 54,388

Int. Cl.[7] H01P *5/18*

U.S. Cl. 333—109 **31 Claims**

1. A differential bus for high signal quality interconnections, having a differential signal applied at at least one non-contact differential coupler having a first and a second constituent non-contact coupler, comprising:



a. at least one impedance termination connected to a port of the non-contact differential coupler for producing at least one common mode reflection at a port of the non-contact differential coupler.

6,016,087

COUPLED MICROSTRIP LINES

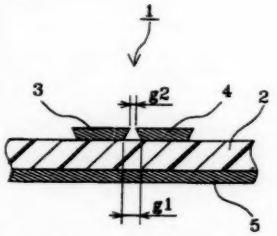
Yutaka Sasaki, Nagaokakyo; Hidefumi Nakanishi, Shiga-ken, and Hiroaki Tanaka, Osaka-fu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 15, 1997, Appl. No. 990,858

Claims priority, application Japan, Dec. 16, 1996, 8-335691

Int. Cl.[7] H01P *5/18*

U.S. Cl. 333—116 **2 Claims**



1. A coupled line having two microstrip lines closely arranged on an upper surface of a dielectric substrate with a ground electrode on a lower surface thereof, wherein a space between the microstrip lines at a top side thereof is smaller than the space therebetween at a bottom side thereof in contact with said dielectric substrate, said two microstrip lines being electromagnetically coupled with each other.

6,016,088

MAGNETOSTATIC WAVE DEVICE

Masaru Fujino, Shiga-ken, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

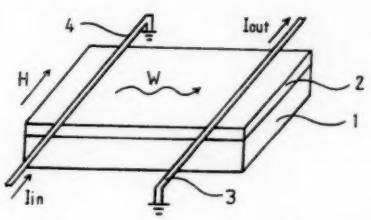
Filed Sep. 18, 1998, Appl. No. 156,477

Claims priority, application Japan, Sep. 24, 1997, 9-258772

Int. Cl.[7] H01P *1/215;* **H01F** *10/28;1/00*

U.S. Cl. 333—147 **8 Claims**

1. A magnetostatic wave device comprising a $Y_3Fe_5O_{12}$-based magnetic garnet single crystal film, said magnetic garnet single crystal film containing indium as a substitute for a part of iron, and having a saturation magnetization ranging from 1,800 G to 3,500 G, wherein the magnetostatic wave device has an insertion loss less than 20 dB and has a critical frequency more than 3.8 GHz at



which a saturation phenomenon is caused by an input electrical power of 1 mW.

6,016,089

PRINTED CIRCUIT WITH RESILIENT CONTACTS PROVIDING A GROUND PATH FOR COMMON-MODE FILTRATION CAPACITORS

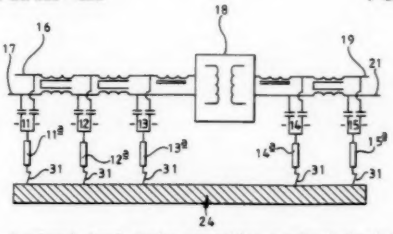
Stephen John Goudie, Solihull, United Kingdom, assignor to Lucas Industries, Solihull, United Kingdom

Filed Dec. 17, 1997, Appl. No. 992,326

Claims priority, application United Kingdom, Dec. 21, 1996, 9626640

Int. Cl.[7] H03H *7/01*

U.S. Cl. 333—181 **9 Claims**



1. A printed circuit device comprising a printed circuit board carrying one or more components and associated connections, common mode filtration capacitors connected in use as common mode filters and associated with component areas of the board where said one or more components are present, a casing component supporting the printed circuit board and electrically grounded in use, and, a plurality of electrically conductive resilient contact elements resiliently engaging said casing component so as to make electrical connection thereto, each of said contact elements being physically secured to the printed circuit board and providing a ground path for at least a respective one of said common mode filtration capacitors, wherein said elements include securing regions extending in respective apertures of the printed circuit board and making electrical contact with their respective common mode filtration capacitor by way of a track of the printed circuit board.

6,016,090

DIELECTRIC RESONATOR APPARATUS AND HIGH-FREQUENCY MODULE

Kenichi Iio, Nagaokakyo; Koichi Sakamoto, Ohtsu; Sadao Yamashita, Kyoto; Toshihiro Hiratsuka, Kusatsu; Tomiya Sonoda, Muko, and Shigeyuki Mikami, Shiga-ken, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 6, 1997, Appl. No. 965,464

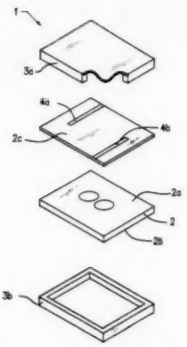
Claims priority, application Japan, Nov. 6, 1996, 8-294087

Int. Cl.[7] H01P *7/10*

U.S. Cl. 333—202 **34 Claims**

1. A dielectric resonator comprising:

a dielectric substrate;



a first conductor formed on one main surface of said dielectric substrate;

a second conductor formed on the other main surface of said dielectric substrate;

a first opening formed in said first conductor such that said dielectric substrate is exposed through said first conductor;

a second opening formed in said second conductor such that said dielectric substrate is exposed through said second conductor;

said dielectric substrate between said first and second openings forming said resonator;

a first electrically conductive plate disposed with a gap from said first conductor so as to cover at least said first opening;

a second electrically conductive plate disposed with a gap from said second conductor so as to cover at least said second opening;

an insulating member formed on at least one of said first conductor and said second conductor; and

a signal input/output electrode formed on said insulating member and electromagnetically coupled to said resonator.

6,016,091

DIELECTRIC RESONATOR DEVICE COMPRISING A DIELECTRIC RESONATOR AND THIN FILM ELECTRODE LAYERS FORMED THEREON

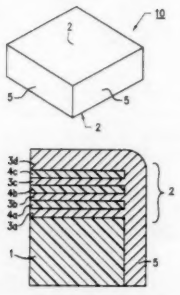
Seiji Hidaka, Nagaokakyo; Norifumi Matsui, Kyoto; Kazuhiko Kubota, Muko, and Tomoyuki Ise, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 9, 1997, Appl. No. 987,273

Claims priority, application Japan, Dec. 11, 1996, 8-331316; Aug. 22, 1997, 9-226183

Int. Cl.[7] **H01P** *7//10*

U.S. Cl. 333—202 **15 Claims**



1. A dielectric resonator device comprising:

a first dielectric resonator;

a first thin film electrode layer formed on a surface of said dielectric resonator;

a dielectric layer formed on said first thin film electrode layer;

a second thin film electrode layer formed on said dielectric layer; and

a third thin film electrode layer for short circuiting said first thin film electrode layer and said second thin film electrode layer, said first and second electrode layers being short circuited at end portions thereof;

further comprising at least one additional dielectric layer and at least one additional thin film electrode layer laminated on said second thin film electrode layer, wherein said third thin film electrode layer short circuits said first thin film electrode layer, said second thin film electrode layer, and said at least one additional electrode layer at end portions thereof.

6,016,092

MINIATURE ELECTROMAGNETIC MICROWAVE SWITCHES AND SWITCH ARRAYS

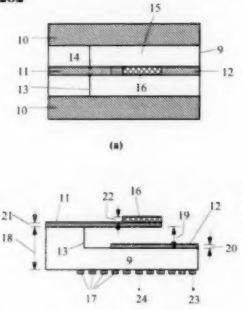
Cindy Xing Qiu, 6215 Bienville St., Brossard, Quebec, Canada, J4Z 1W2; Yi-Chi Shih, 2216 Thorley Pl., Palos Verdes Estate, Calif. 90274, and Lap Sum Yip, 57 Granville Blvd., Hampstead, Quebec, Canada, H3X 3B7

Filed Aug. 10, 1998, Appl. No. 131,594

Claims priority, application Canada, Aug. 22, 1997, 2211830

Int. Cl.[7] **H01P** *1//10*

U.S. Cl. 333—262 **26 Claims**



1. A miniature electromagnetic microwave switch for coplanar waveguide transmission lines comprising;

(a) a first dielectric substrate having at least one input conducting electrode and at least one output conducting electrode deposited on front surface of said first dielectric substrate for propagation of microwave signals;

(b) a cantilever with projection overlapping at least a part of said input conducting electrode and output conducting electrode;

(c) a magnetic film deposited on a part of a front surface of said cantilever opposing said first dielectric substrate for actuating said cantilever and causing said microwave signals to propagate from said input conducting electrode to said output conducting electrode;

(d) at least two conducting ground strips, one on each side of said input and output conducting electrodes to effect propagating of said microwave signals;

(e) a first thin film electromagnetic coil on a back surface of said first dielectric substrate for actuating said cantilever, the center of said first thin film electromagnetic coil substantially coinciding with the center of said magnetic film.

6,016,093

DEFLECTION UNIT INCLUDING A LINE BALANCE COIL

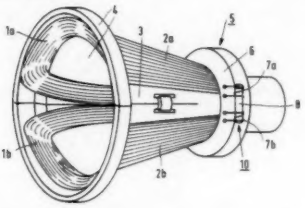
Antonius P. M. Grubben, and Jacobus J. M. Van De Meerakker, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 31, 1996, Appl. No. 656,148

Claims priority, application European Pat. Off., Jun. 9, 1995, 95201527

Int. Cl.[7] **H01F** *7/00*

U.S. Cl. 335—210 **17 Claims**



1. A deflection unit including a line, deflection coil system having line deflection coils connected in an electric circuit to a line balance coil arrangement comprising a coil cylinder which is provided with two sub-coils and balance coil lead-outs and within which a magnet core is arranged, wherein the coil cylinder comprises an arrangement of bent metal connection strips which provide a direct connection between the balance coil lead-outs, the line deflection coils and a tap, said coil cylinder further comprising a plurality of supporting members which are integrated with the arrangement of metal connection strips which are formed from a lead frame.

6,016,094

SUPERCONDUCTING SHORT CIRCUIT CURRENT LIMITER

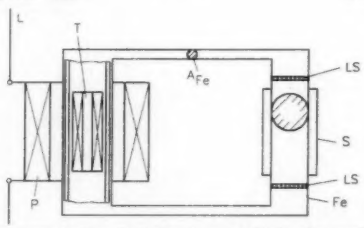
Jürgen Gerhold, Graz, Austria, assignor to Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

Continuation-in-part of application No. PCT/EP97/02976, Jun. 7, 1997. This application Nov. 18, 1998, Appl. No. 195,087.

Claims priority, application Germany, Jul. 13, 1996, 196 28 358

Int. Cl.[7] **H01F** *1/00*

U.S. Cl. 335—216 **6 Claims**



1. A superconducting short circuit current limiter for an alternating current power supply net, comprising:

an annular iron core for guiding a magnetic flux, a primary coil connected in said power supply net and being magnetically coupled with, and surrounding, one section of said iron core, a superconductive short-circuited secondary coil magnetically coupled with, and surrounding, another section of said iron core and being arranged in a spatially distant relationship from said primary coil, said iron core having two gaps at opposite sides of said secondary coil for thermally uncoupling the iron core section surrounded by said secondary coil from another section of said iron core, said one section of said iron core disposed in said primary coil having a cylindrical cavity, and a tertiary coil arranged within said cavity coaxially with said primary coil whereby said tertiary coil is magnetically coupled with said primary coil, said tertiary coil having a heat capacity so selected that said tertiary coil can accommodate the joulean heat generated when a fault or short circuit occurs in said power supply net, said iron core having in the area of said cavity a reduced cross-section providing for a magnetic flux restriction so selected that it becomes magnetic flux saturated when the current in said primary coil exceeds a predetermined reaction current.

6,016,095

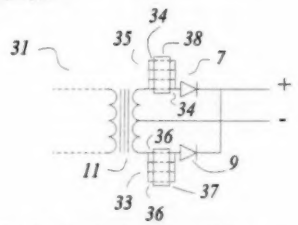
SNUBBER FOR ELECTRIC CIRCUITS

Edward Herbert, 122 N. Shore Rd., P.O. Box 241, Greensboro, Vt. 05841-0241

Provisional application No. 60/052,371, Jul. 11, 1997. This application Jul. 6, 1998, Appl. No. 110,902.

Int. Cl.[7] **H01F** *17/06;30/12*

U.S. Cl. 336—175 **3 Claims**



1. A snubber for electric circuits comprising:

a plurality of cores made of a lossy magnetic material

the cores having a low flux capacity so as to saturate quickly and the lossy magnetic material having a significant imaginary component of complex inductance

each of the plurality of cores having a through hole therein, and

a plurality of electrical conductors, each of the plurality of electrical conductors further having a first end and a second end,

the plurality of electrical conductors passing respectively through the through holes of the plurality of cores,

such that the through hole of each and every one of the plurality of cores has one and only one of the plurality of conductors passing through it, and

the plurality of electrical conductors further being connected in parallel at both ends of the plurality of electrical conductors by connecting all of the first ends of the plurality of conductors together and by connecting all of the second ends of the plurality of conductors together so as to make a parallel-connected array of the plurality of cores,

and the plurality of electrical conductors.

6,016,096

CONTROL MODULE USING SHAPE MEMORY ALLOY

Gregory Barnes, Murrayville, Pa.; Jon Skekloff, Holland, Mich.; David D. Martin, Dunbar, and Douglas Ray, Irwin, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Provisional application No. 60/049,445, Jun. 12, 1997. This application Jun. 12, 1998, Appl. No. 94,580.

Int. Cl.[7] **H01H** *61/06;37/46;37/50*

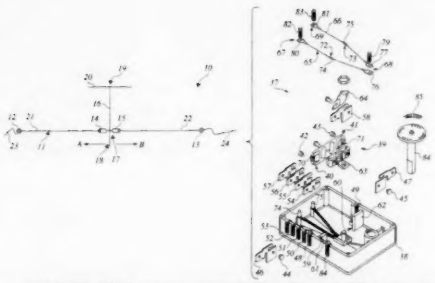
U.S. Cl. 337—123 **36 Claims**

1. A switching control module comprising:

a single-piece elongated shape memory alloy actuator having a first portion and a second portion;

a switching arm, coupled to the first and second actuator portions, the arm having first and second positions;

a first electrical contact;



a second electrical contact connected to the switching arm, and disposed to be electrically isolated from the first electrical contact when said arm is in the first position and disposed to be electrically connected to the first electrical contact when said arm is in the second position;

a first electrical path for applying an electrical current through the first portion of the actuator;

a second electrical path for applying an electrical current through the second portion of the actuator;

a housing; and

a control device for effecting movement of the switching arm from the first position to the second position and from the second position to the first position.

6,016,097

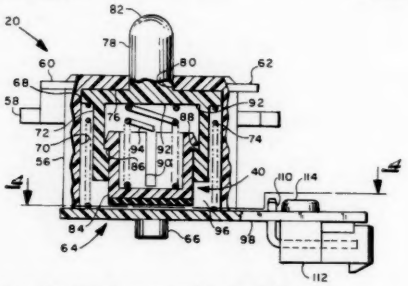
MOTION TRANSDUCER

David J. Gardner, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 29, 1997, Appl. No. 924,014

Int. Cl.[7] H01C *10/10*

U.S. Cl. 338—47 **8 Claims**



1. A motion transducer assembly comprising:

(a) body means having an actuator moveably disposed therein and having portions thereof accessible exteriorly of said body means and adapted for user imparted movement thereof;

(b) a capsule having a housing removably attached to said body means, and including,

(i) a force/pressure sensitive electrical means aperture to change to electrical impedance upon application of force/pressure thereto;

(ii) a first plunger operatively contracted by said actuator and moveable thereby and including first stop surfaces;

(iii) a second plunger slidably received on said first plunger, and including second stop surfaces limiting movement of said second plunger with respect to said first plunger;

(iv) a spring biasing said second plunger, in a direction to causing said second stop surfaces to contact said first stop surfaces; and,

(c) electrical terminal means connected to said electrical means, and adapted for external electrical circuit connection thereto wherein, upon user movement of said actuator, said first plunger is moved causing said second plunger to contact said electrical means, and upon continued movement of said actuator, said contact is broken between said first and second stop surfaces and overtravel is absorbed by relative movement of said first and second plunger and said spring effects increasing force of said second plunger on said electrical means.

6,016,098

VARIABLE RESISTOR

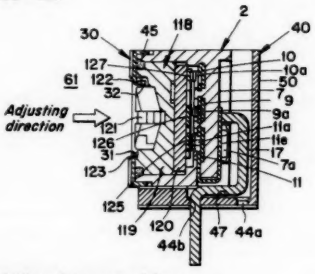
Katsuhiro Onishi, Sabae; Kiminori Yamauchi, Fukui; Hideaki Tsukada, Sabae; Yukinori Ueda, and Fumitoshi Masuda, both of Fukui-ken, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Nov. 28, 1997, Appl. No. 980,299

Claims priority, application Japan, Nov. 28, 1996, 8-318356

Int. Cl.[7] H01C *10/30*

U.S. Cl. 338—160 **13 Claims**



1. A variable resistor comprising:

a case having a recess formed therein, said recess having a bottom surface;

a plurality of slide contactors disposed on said bottom surface of said recess;

a rotor which is rotationally received in said recess, said rotor including a surface containing a resistor, and an electrode connected to at least one end of said resistor, wherein said resistor and said electrode engage respective slide contactors at a plurality of respective contact portions, the rotor comprising either a first rotor or a second rotor having different symmetrical orientations of said resistor and electrode formed on their respective rotor surfaces;

a plurality of terminals electrically connected to the respective contact portions; and

a cover disposed over an opening of said recess;

wherein said case, slide contactors and cover are configured to accommodate either said first rotor or said second rotor.

6,016,099

AUTOMATICALLY ACTIVE PERSONAL ALERT SAFETY SYSTEM

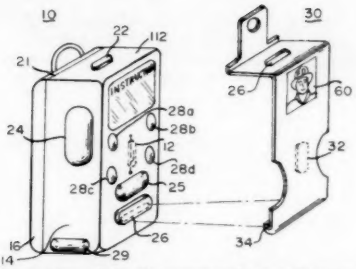
James P Campman, 329 Bendhill Rd., Fredonia, Pa. 16124

Filed Jun. 16, 1998, Appl. No. 97,819

Int. Cl.[7] G08B *23/00*

U.S. Cl. 340—321 **15 Claims**

1. A personal alert safety system having condition responsive sensor means and alarm means indicative of personal safety conditions comprising; a small size portable casing, said casing comprising an internal divided two part chamber, the first part being a watertight sealed cavity and the second part being a sound resonating cavity with surrounding walls including at least one sound port providing a passage from the interior to the exterior of said resonating cavity; a sealed flat wall means comprising a dividing wall between said two chamber parts electric and electronic control and operating circuitry means disposed in said first part of said chamber including a source of electric power, two series connected, single pole, push button control switches each having "on" and "off" positions and being spring biased-to the "off" position, and flip-flop electronic switching means controlled by said control



switches to enable said circuitry means to be turned "on" and "off" respectively by a sequence of simultaneous operations of said two control switches; said sealed flat wall means comprising a thin flat sound generating piezoelectric transducer device electrically connected to said circuitry means; a motion detector, and means rigidly mounted said motion detector within said first part of said two part chamber, said motion detector generating a sine wave voltage output a characteristic of which changes responsive to motion of said casing; and said circuitry means further including a tone oscillator, a rate oscillator and an amplifier, connected between said motion detector and said piezoelectric sound generating transducer and responsive to the output of said motion detector and said piezoelectric sound generating transducer and responsive to the output of said motion detector to cause a specific high intensity sweeping alarm signal to be emitted when the circuitry means is turned on and in the event that the casing is motionless, wherein improvement comprising:

said portable casing being semi-transparent and illuminating from within, the said illumination causing said portable casing to glow, change color or color pattern;

a key retaining bump positioned on a top portion of said semi-transparent casing;

a key retaining slot positioned on a bottom portion of said semi-transrarent casing;

a removable tethered spring loaded tally key having at least one embedded magnet and a retaining window, said at least one embedded magnet automatically causing the personal alert safety system to activate when said tethered spring loaded tally key is removed, an said retaining window accommodating unique identification means for uniquely identifying said tally key with the personal alert system; and

a magnetically activating reed switch positioned on a front face portion of said semitransparent casing above said key retaining slot and electrically connected to said circuitry means for sensing the presence or absence of the magnetic field embedded in said tally key.

6,016,100

ULTRASONIC ANIMAL DETERRENT FOR PROTECTING AN AREA

Randal D. Boyd, Knoxville, and Walter J. Frankewich, Jr., Maryville, both of Tenn., assignors to Radio Systems Corporation, Knoxville, Tenn.

Filed Jul. 8, 1998, Appl. No. 111,512
Int. Cl.[7] G08B *3/10;* **A01K** *15/02*
U.S. Cl. 340—384.2 **20 Claims**

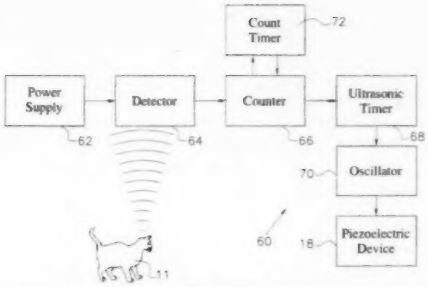
1. An animal deterrent system for frightening an animal away from a protected area, said animal deterrent system including:

a detector for detecting an external signal, said external signal representing an animal, said external signal being continuous;

a detection signal generator responsive to said detector for generating a detection signal;

a counter responsive to said detection signal for counting at least one said detection signal;

a count timer for timing a summation period, said summation period being a period of time for counting said at least one detection signal;



a deterrent signal generator responsive to said counter for generating a deterrent initialization signal after a number of said detection signals have been counted within said summation period;

an output device responsive to said deterrent initialization signal for delivering a deterrent stimulus;

a deterrent timer responsive to said deterrent initialization signal for activating said output device for a predetermined amount of time, thereby creating a delay between each said deterrent stimulus;

a sensor unit housing for containing said detector, said counter, said detection signal generator, said deterrent signal generator, said output device, said count timer, and said deterrent timer; and

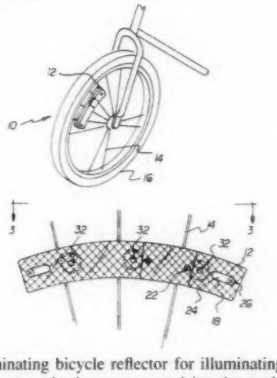
a detector cover for passing said external signal to said detector through said sensor unit housing.

6,016,101

ILLUMINATING BICYCLE REFLECTOR

Patrick M. Brown, 990 Loma Dr., Ojai, Calif. 93023

Filed Nov. 17, 1998, Appl. No. 193,810
Int. Cl.[7] B62J *3/00*
U.S. Cl. 340—432 **5 Claims**



1. An illuminating bicycle reflector for illuminating a series of flashing lights as a wheel rotates comprising, in combination:

a housing securable between spokes of a standard bicycle wheel, the housing being comprised of an arcuate outer portion, an arcuate inner portion, and a hollow interior disposed therebetween, the housing being fabricated of a reflective, generally translucent plastic material, the arcuate outer portion being coupled together with the arcuate inner portion via screws, the housing having a pair of slotted apertures extending through the arcuate outer and inner portions for receiving hardware therethrough to facilitate securement of the housing between spokes of a standard bicycle wheel, the arcuate inner portion having a removable access panel coupled therewith, the access panel exposing a power source, the power source being a battery;

a plurality of LED's disposed within the hollow interior of the housing in a spaced relationship, the plurality of LED's being in communication with the power source to facilitate activation thereof;

a flasher circuit being in communication with the plurality of LED's and the power source;

an inertia switch being in communication with the plurality of LED's and the power source;

a photo switch being in communication with the plurality of LED's and the power source.

6,016,102

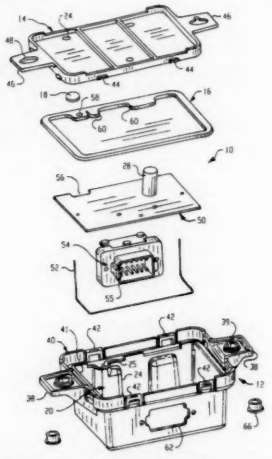
PRESSURE SENSOR HOUSING

G. Clark Fortune, Farmington Hills; Thomas J. Waraksa, Clarkston; James K. Spring, Brighton, and John D. Prainito, Rochester Hills, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 29, 1999, Appl. No. 240,756

Int. Cl.[7] B60C *23/00*

U.S. Cl. 340—442 **20 Claims**



1. An apparatus for measuring atmospheric pressure for compensating a pressure measurement in a sealed enclosure, comprising:

a housing, one end of said housing being open;

a cover positioned on said housing, said cover being constructed to be received on the open end of said housing for providing a sealing fit therewith, said cover having an opening therethrough for allowing pressure equalization with an interior of said housing;

a gasket interposed between said cover and said housing, said gasket being constructed of a material that provides a fluid-tight seal between said cover and said housing, said gasket having at least one passage of a predetermined size for allowing passage of air between said opening in said cover and said interior of said housing;

a gas permeable membrane also interposed between said opening in said cover and said housing, said gas permeable membrane being constructed of a material that allows air to pass therethrough;

a pressure sensor positioned within said housing for measuring atmospheric pressure based upon the air passed through said gas permeable membrane into said housing; and

means for receiving a pressure signal from a sealed enclosure and compensating the pressure signal based upon the measured atmospheric pressure.

6,016,103

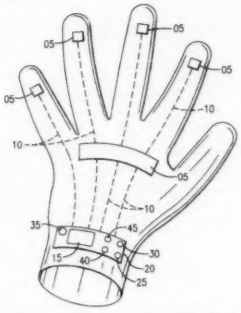
SLEEP-DETECTING DRIVING GLOVES

Larry Leavitt, 329 Kenwood Ave., Delmar, N.Y. 12054

Provisional application No. 60/060,043, Sep. 25, 1997. This application Sep. 24, 1998, Appl. No. 159,737.

Int. Cl.[7] G08B *23/00*

U.S. Cl. 340—575 **3 Claims**



1. A sleep-detecting system for use while driving comprising

a) a hand-worn device on the left hand and a hand-worn device on the right hand,

b) at least one pressure sensor on each hand-worn device for measuring grip pressure between the associated hand and a steering wheel,

c) remote communication means between the hand-worn devices on the left and right hands, and

d) an alarm activated when grip pressure of both hands falls below a threshold value.

6,016,104

SYSTEM FOR CONTROLLING THE RESISTANCE OF A LOAD CONNECTED TO A TRANSFORMER

Klaus Dobler, Gerlingen; Erich Zabler, Stutensee; Anton Dukart, Worth, and Thomas Herrmann, Langenbrettach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

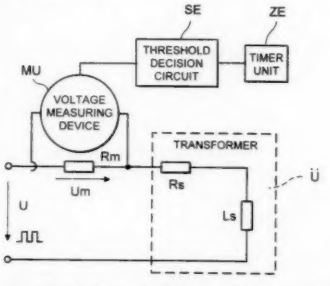
PCT No. PCT/DE96/00739, § 371 Date Feb. 18, 1998, § 102(e) Date Feb. 18, 1998, PCT Pub. No. WO97/06980, PCT Pub. Date Feb. 27, 1997

PCT Filed Apr. 27, 1996, Appl. No. 29,092

Claims priority, application Germany, Aug. 19, 1995, 195 30 588

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—646 **7 Claims**



1. An arrangement for monitoring a resistance of a load to monitor an operability of an airbag, the load being connected to a secondary side of a transformer, comprising:

a measuring device for measuring exclusively an inductance of the transformer on a primary side of the transformer; and

a signaling device for signaling a load malfunction if the measured inductance deviates from a predetermined value.

6,016,105

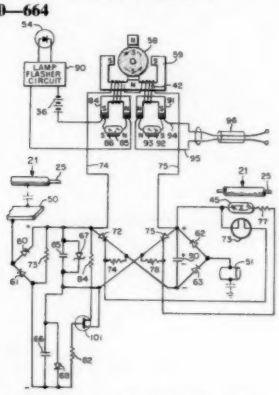
FAULT INDICATOR PROVIDING CONTACT CLOSURE AND LIGHT INDICATION ON FAULT DETECTION

Edmund O. Schweitzer, Jr., Northbrook, Ill., assignor to E.O. Schweitzer Manufacturing Co., Inc., Mundelein, Ill.

Continuation-in-part of application No. 09/070,224, Apr. 30, 1998, abandoned. This application Jul. 17, 1998, Appl. No. 118,756.

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—664 **18 Claims**



1. A fault indicator for indicating the occurrence of a fault current in an electrical conductor, comprising:

a housing;

a battery;

a lamp operable from said battery and viewable from the exterior of the housing;

a first magnetic circuit including a first magnetic pole piece, a first magnetically actuated switch and a first bias magnet, said bias magnet having a magnetic polarity which opposes a magnetic field in said magnetic pole piece in one direction, and reenforces a magnetic field in said magnetic pole piece in the other direction, whereby said magnetically actuated switch is conditioned to a reset indicating state in response to a magnetic field in said magnetic pole piece in said one direction and to a fault indicating state in response to a magnetic field in said magnetic pole piece in said other direction;

a second magnetic circuit including a second magnetic pole piece, a second magnetically actuated switch and a second bias magnet, said bias magnet having a magnetic polarity which opposes a magnetic field in said magnetic pole piece in one direction, and reenforces a magnetic field in said magnetic pole piece in the other direction, whereby said magnetically actuated switch is conditioned to a reset indicating state in response to a magnetic field in said one direction and to a fault indicating state in response to a magnetic field in said other direction;

circuit means including a magnetic winding in magnetic communication with said first and second magnetic pole pieces and responsive to the current in the monitored conductor for developing a magnetic field in said magnetic pole pieces in a direction to condition said first and second magnetically actuated switches to said reset indicating states during normal current flow in the monitored conductor, and for developing a magnetic field in said pole pieces in said opposite direction to condition said first and second magnetically actuated switches to said fault indicating states upon occurrence of a fault current in the conductor; and

said first magnetically actuated switch connecting said battery to said lamp in said fault indicating state whereby said lamp lights in said fault indicating state; and

said second magnetically actuated switch being connected to an external indicating or control circuit for remote indication of said reset and fault indicating states.

6,016,106

PAGING SYSTEM

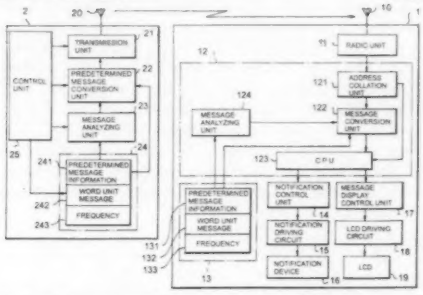
Michihito Ohtsuki, Shizuoka, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 25, 1997, Appl. No. 806,108

Claims priority, application Japan, Feb. 26, 1996, 8-038188

Int. Cl.[7] G08B *5/22*

U.S. Cl. 340—825.44 **7 Claims**



1. A paging system having a selective calling receiver which receives a selective call signal transmitted from a base station, the selective call signal including message information, the paaing system comprising:

display means for obtaining a corresponding regular message from the message information and displaying the regular message;

division means for dividing the received message information into predetermined set units;

memory means for storing predetermined message information and the message information divided into the set units; and

count means for incrementing the freguencv of the set unit message information to be stored in said memory means if the message information is the same as set unit message information which has been stored previously.

6,016,107

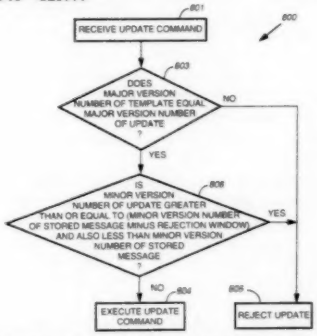
RELIABLY UPDATING AN INFORMATION SERVICE MESSAGE

Frederick Loring Kampe, Boynton Beach, Fla.; Scott Christopher Smith, St. Louis, Mo.; Jheroen Pieter Dorenbosch, Paradise, Tex., and Robert Nathan Nelms, Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Provisional application No. 60/038,715, Mar. 7, 1997. This application Jun. 30, 1997, Appl. No. 886,102.

Int. Cl.[7] G08B *5/22*

U.S. Cl. 340—825.44 **9 Claims**


RECEIVE UPDATE COMMAND
DOES MAJOR VERSION NUMBER OF TEMPLATE EQUAL MAJOR VERSION NUMBER OF UPDATE ?
NO
YES
IS MINOR VERSION NUMBER OF UPDATE GREATER THAN OR EQUAL TO (MINOR VERSION NUMBER OF STORED MESSAGE MINUS REJECTION WINDOW) AND ALSO LESS THAN MINOR VERSION NUMBER OF STORED MESSAGE ?
YES
NO
EXECUTE UPDATE COMMAND
REJECT UPDATE

1. In a selective call device comprising a processor coupled to a memory element, the selective call device configured to receive a signal transmitted in a standard transport-layer wireless selective call communication protocol format the signal comprising an

address portion and a message portion a message portion comprising at least one sub-message, a method of updating sub-messages stored in the memory element comprising the steps of:

(a) receiving a signal comprising a sub-message and a major version number and storing the sub-message and the major version number in the memory element;

(b) subsequent to step (a), receiving an update command within the message portion of said standard transport-layer wireless selective call communication protocol format, the update command comprising a major version number, at least one sub-address and at least one sub-message, each sub-address corresponding to a corresponding sub-message; and

(c) determining from the major version number of the update command whether the selective call device is permitted to receive the at least one sub-message within the update command, and updating the memory element in a manner dependent upon the sub-address, the sub-message, and the update command.

6,016,108

ANTENNA TUNING CONTROL SYSTEM

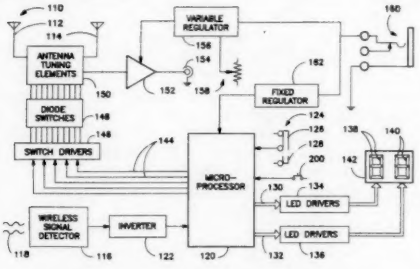
Neil D. Terk, Laurel Hollow, N.Y.; John A. Lofgren, Glendale, and William R. Steinike, Grafton, both of Wis., assignors to Terk Technologies Corporation, Plainview, N.Y.

Continuation of application No. 08/515,544, Aug. 16, 1995, Pat. No. 5,812,066. This application Jan. 19, 1998, Appl. No. 8,729.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04Q *1/00*

U.S. Cl. 340—825.72 **13 Claims**



1. A device for optimizing antenna operation, comprising:

detector means for detecting a wireless control signal generated by a remote control unit in response to user manipulation and encoding a broadcast channel or station selected by a user;

processing means operatively connected to said detector means for analyzing said wireless control signal during a learning operation to learn a coding format of said wireless control signal, including timing characteristics and digit signal codes, thereby enabling adaptation of the device to wireless remote control units of different manufacturers, and for analyzing said wireless control signal during a normal use operation to determine a broadcast channel or station selected by a user; and

control means operatively connected to said processing means and to an antenna for controlling operation of said antenna, in response to signals generated by said processing means in response to a channel or station selection encoded in said wireless control signal.

6,016,109

MOBILE UNIT SUPPORT SYSTEM

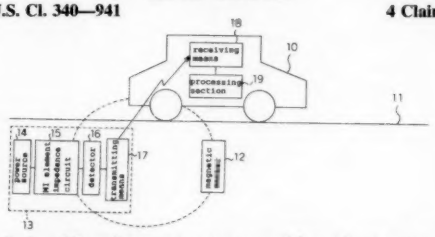
Takasi Yosida, Ikoma; Joji Kane, Nara, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 30, 1998, Appl. No. 49,998

Claims priority, application Japan, Mar. 28, 1997, 9-077013

Int. Cl.[7] G08G *1/01*

U.S. Cl. 340—941 **4 Claims**



1. A mobile unit support system comprising at least one magnetic sensor including

an impedance circuit employing a magnetic impedance element having an impedance that is changed by a variation of a surrounding magnetic field,

a power source which supplies a current to the impedance circuit,

a detector which detects a change in an output of the impedance circuit caused by a change of impedance of the magnetic impedance element; and

a transmitter for transmitting a signal indicating detection of a change in the output of the impedance circuit caused by a change of impedance of the magnetic impedance element; and

at least one mobile unit having:

a plurality of magnetic members arranged in a substantially linear manner, polarities of the plurality of magnetic members being alternately inverted on a side of the at least one mobile unit facing the impedance circuit,

a receiver for receiving signals transmitted by the transmitter of the at least one magnetic sensor, and

a processor which processes signals received by the receiver and informs a driver of the at least one mobile unit of information obtained by processing the signals received by the receiver, or which processes signals received by the receiver and controls movement of the at least one mobile unit on the basis of the processing, wherein a number of the plurality of magnetic members disposed in the at least one mobile unit corresponds to one of a length of the at least one mobile unit, a weight of the at least one mobile unit, and a width of the at least one mobile unit.

6,016,110

MAP DISPLAY DEVICE, MAP DISPLAY METHOD, NAVIGATION DEVICE AND AUTOMOBILE

Takashi Takinami, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1997, Appl. No. 998,901

Claims priority, application Japan, Mar. 26, 1996, 8-348812

Int. Cl.[7] G08G *1/123*

U.S. Cl. 340—995 **10 Claims**

1. A map display signal generating method in which a specified range of data is read out from prepared map data and a signal for display is generated, comprising:

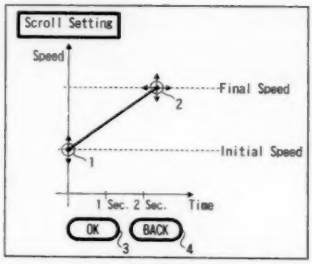
a scroll starting step for instructing a display range change;

a scroll step for scrolling a map display range on a basis of the instruction in said scroll starting step;

a scroll finishing step for finishing said scrolling,

wherein a scroll speed in said scroll step is a continuous function relative to time and an acceleration in said scrolling is constant; and

a parameter designating step for designating at least one of a starting speed and a finishing speed of said scrolling, wherein



said parameter designating step presents a graph-like display mode having axes of time and speed.

6,016,111

DIGITAL DATA CODING/DECODING METHOD AND APPARATUS

Sung-hee Park, Seoul; Yeon-bae Kim, Suwon, and Jae-seob Shin, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

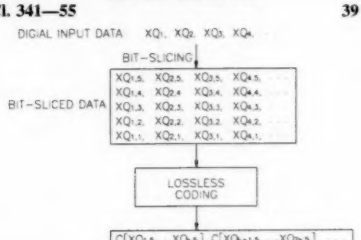
Filed Nov. 26, 1997, Appl. No. 978,881

Claims priority, application Rep. of Korea, Jul. 31, 1997, 97-36520; Nov. 19, 1997, 97-61299

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H03M *7/00*

U.S. Cl. 341—55 **39 Claims**



1. A method for coding a sequence of digital data of a predetermined number comprising the steps of:

(a) representing the respective digital data by digits of a predetermined same number; and

(b) coding the digital data represented by the same number digits from the most significant digit sequences to the least significant digit sequences.

6,016,112

SYSTEM AND METHOD FOR REDUCING ERRORS IN AN ANALOG TO DIGITAL CONVERTER

Niels Knudsen, Austin, Tex., assignor to National Instruments Corporation, Austin, Tex.

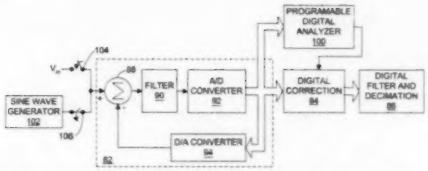
Continuation-in-part of application No. 09/105,847, Jun. 26, 1998, which is a continuation-in-part of application No. 08/771,480, Dec. 23, 1996, Pat. No. 5,781,137, and a continuation-in-part of application No. 09/105,283, Jun. 26, 1998, which is a continuation-in-part of application No. 08/772,785, Dec. 23, 1996, Pat. No. 5,781,138, and a continuation-in-part of application No. 09/186,314, Nov. 4, 1998. This application Nov. 25, 1998, Appl. No. 199,937.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H03M *1/06*

U.S. Cl. 341—118 **34 Claims**

1. A method for performing analog to digital conversion in an analog to digital (A/D) converter, the method comprising:



applying an analog signal to an input of the A/D converter;

converting the analog signal into a first digital signal using the A/D converter, wherein the first digital signal includes first linearity errors;

translating the first digital signal into a second digital signal, wherein said translating compensates for linearity errors in the first digital signal, where the second digital signal has reduced linearity errors when compared to the first linearity errors in the first digital signal, wherein said translating comprises indexing into a look-up table, wherein the look-up table stores a plurality of digital values,

wherein the plurality of digital values in the look-up table are generated as follows:

applying an analog waveform to the A/D converter, wherein the A/D converter generates output digital samples representative thereof;

recording a plurality of the output digital samples;

generating linearity error information from the recorded plurality of output digital samples;

calculating linearity error correction coefficients c(m) as a function of the linearity error information; and

generating the plurality of digital values from the linearity error correction coefficients c(m).

6,016,113

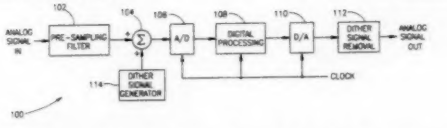
SYSTEM FOR ENHANCING THE ACCURACY OF ANALOG-DIGITAL-ANALOG CONVERSIONS

Yehuda Binder, 30/8 Yeshurun Street, Hod Hasharon 45200, Israel

Filed Jun. 26, 1997, Appl. No. 882,826

Int. Cl.[7] H03M *1/20*

U.S. Cl. 341—131 **35 Claims**



1. An apparatus for delaying an input analog signal to generate an output analog signal, comprising:

an analog dither signal generator;

means for combining said analog dither signal with the analog input signal to generate a first combined analog signal;

first conversion means for converting said first combined analog signal into a digital signal;

delay means for delaying said digital signal;

second conversion means for converting said delayed digital signal into a second combined analog signal; and

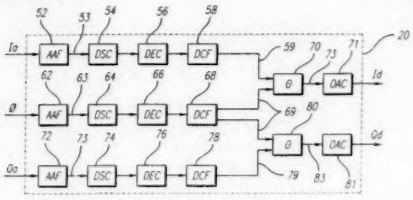
means for removing said analog dither signal component from said second combined analog signal to yield the output analog signal.

6,016,114

APPARATUS AND METHOD OF FABRICATING MIXED SIGNAL INTERFACE IN GSM WIRELESS APPLICATION

Edward W. Liu, Sunnyvale, and Qasim Rashid Shami, Fremont, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 21, 1997, Appl. No. 840,946
Int. Cl.[7] H03M *3/00*
U.S. Cl. 341—143 **37 Claims**



1. An integrated circuit comprising:

a first circuit for processing a first analog signal and producing a first digital output;

a second circuit for processing a second analog signal and producing a second digital output;

a third circuit for processing a third analog signal and producing a third digital output;

a first digital subtractor circuit, connected to said first circuit and connected to said second circuit, to subtract said second digital output from said first digital output; and

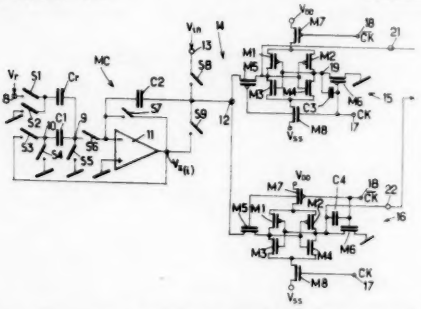
a second digital subtractor circuit, connected to said third circuit and connected to said second circuit, to subtract said second digital output from said third digital output.

6,016,115

RECIRCULATING A/D OR D/A CONVERTER WITH SINGLE REFERENCE VOLTAGE

Alexandre Heubi, La Chaux-de-fonds, Switzerland, assignor to Soprintel S.A., La Chaux-de-fonds, Switzerland

Continuation of application No. PCT/WO97/08835, Aug. 26, 1996. This application Feb. 27, 1998, Appl. No. 32,565.
Claims priority, application France, Aug. 29, 1995, 95 10174
Int. Cl.[7] H03M *1/38*
U.S. Cl. 341—161 **10 Claims**



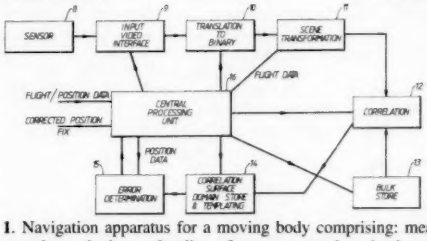
1. A converter for converting an input signal into an output signal representing said input signal with a relative precision, the converter implementing a conversion algorithm with three decision ranges involving ternary digital values b_j with b_j=1, 0, or −1, and comprising a single unipolar reference voltage source, means of computation for, in the course of each of the iterations of a sequence of successive iterations of said algorithm, determining a voltage value formed by the sum of a value determined on the basis of the voltage computed in the previous iteration and of a value which is the product of the ternary value obtained in the course of the previous iteration and of said reference voltage, said means of computation comprising for this purpose a unilateral arrangement of a plurality of switched capacitances and a single operational amplifier cooperating with said switched capacitors for delivering said voltage value in each of the said iterations, said converter also comprising generator means for producing, from the successive voltage values computed during said sequence of iterations, successive samples representing, in converted form, said input signal, one of the inputs of said operational amplifier being connected to a fixed potential, said reference source providing a single unipolar reference voltage referenced to said fixed potential.

6,016,116

NAVIGATION APPARATUS

David Sydney Henderson, Wickford; William Douglas McGinn, Basildon, and Stewart David Miles, Billericay, all of United Kingdom, assignors to GEC Avionics Limited, United Kingdom

Filed Sep. 30, 1987, Appl. No. 105,112
Int. Cl.[7] G01S *13/00*
U.S. Cl. 342—64 **16 Claims**



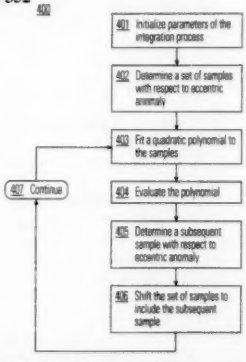
1. Navigation apparatus for a moving body comprising: means arranged to obtain a plurality of area scenes by viewing the surroundings of the body as it moves; means arranged to compare said plurality of scenes with a reference area which is large relative to each of said plurality of scenes; and means for finding the overall position of best match between said plurality of said area scenes taken together and said large reference area.

6,016,117

METHOD FOR THE EFFICIENT DETERMINATION OF GPS SATELLITE ORBITAL POSITION

Robert Leonard Nelson, Jr., Austin, Tex., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Jun. 26, 1998, Appl. No. 105,595
Int. Cl.[7] H04B *7/185*
U.S. Cl. 342—352 **19 Claims**


400
401 Initializes parameters of the integration process
402 Determine a set of samples with respect to eccentric anomaly
403 Fit a quadratic polynomial to the samples
404 Evaluate the polynomial
405 Determine a subsequent sample with respect to eccentric anomaly
406 Shift the set of samples to include the subsequent sample
407 Continue

1. In a global positioning system (GPS) receiver, a method for efficiently calculating a plurality of samples of the position of an orbiting GPS satellite, wherein the GPS receiver includes a processor coupled to a computer readable memory storing computer

readable instructions which, when executed by the processor, cause the GPS receiver to execute the method, the method comprising the steps of:

calculating a time tagged first sample of the orbital position of a GPS satellite in terms of eccentric anomaly;

calculating a time tagged second sample of the orbital position of said GPS satellite in terms of eccentric anomaly; and

determining a subsequent sample of the orbital position of said GPS satellite, wherein said subsequent sample is uniformly spaced with respect to said first sample and said second sample in terms of eccentric anomaly.

6,016,118

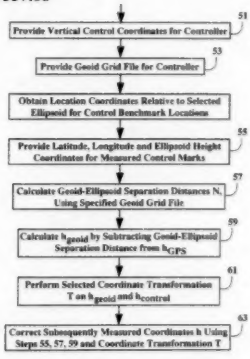
REAL TIME INTEGRATION OF A GEOID MODEL INTO SURVEYING ACTIVITIES

Michael E. Jackson, Christchurch, New Zealand, and Richard Jackson, San Francisco, Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Mar. 5, 1998, Appl. No. 35,667

Int. Cl.[7] **G01S** *5/02*

U.S. Cl. 342—357.06 **7 Claims**


Provide Vertical Control Coordinates for Controller
51
Provide Geoid Grid File for Controller
53
Obtain Location Coordinates Relative to Selected Ellipsoid for Control Benchmark Locations
Provide Latitude, Longitude and Ellipsoid Height Coordinates for Measured Control Marks
55
Calculate Geoid-Ellipsoid Separation Distances N, Using Specified Geoid Grid File
57
Calculate h_{geoid} by Subtracting Geoid-Ellipsoid Separation Distance from h_{GPS}
59
Perform Selected Coordinate Transformation T on h_{geoid} and $h_{control}$
61
Correct Subsequently Measured Coordinates h Using Steps 55, 57, 59 and Coordinate Transformation T
63

1. A method for enhancing the accuracy of survey location coordinates, the method comprising the steps of:

receiving a set of known location coordinates for at least three selected known survey locations;

receiving a sequence of location coordinates representing a grid of locations that are part of a selected geoid that represents a selected region on or near the Earth's surface, where each of at least three selected geoid locations coincides with one of the at least three known survey locations;

receiving location coordinates for each of a selected group of survey control locations, referenced to a selected local datum;

estimating the location coordinates, relative to the local datum, of each of the at least three selected geoid locations;

determining a separation distance between each of the at least three selected geoid locations and the local datum;

determining a location coordinate transformation of the geoid onto at least a portion of the local datum, where each of the at least three selected geoid locations is transformed into a corresponding one of the at least three known survey locations; and

applying the location coordinate transformation to location coordinates for at least one selected survey location that is not one of the at least three selected geoid locations.

6,016,119

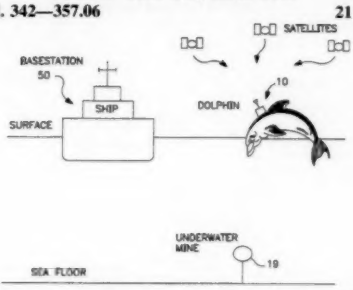
METHOD AND APPARATUS FOR DETERMINING THE LOCATION OF AN OBJECT WHICH MAY HAVE AN OBSTRUCTED VIEW OF THE SKY

Norman F. Krasner, San Carlos, Calif., assignor to SnapTrack, Inc., San Jose, Calif.

Division of application No. 08/723,219, Oct. 7, 1996, Pat. No. 5,831,574, Provisional application No. 60/005,318, Oct. 9, 1995. This application Sep. 28, 1998, Appl. No. 162,314.

Int. Cl.[7] **G01S** *5/02*; **H04B** *7/185*

U.S. Cl. 342—357.06 **21 Claims**



14. A method of tracking a remote object comprising the steps of:

fitting a remote object with a positioning sensor configured to receive and store positioning information when said remote object is in a fix position;

positioning said remote object in a fix position such that said positioning sensor is capable of detecting an activation signal;

receiving and storing a predetermined amount of data in said positioning sensor, said data comprising positioning information; and

processing said data to determine the location of said fix position.

6,016,120

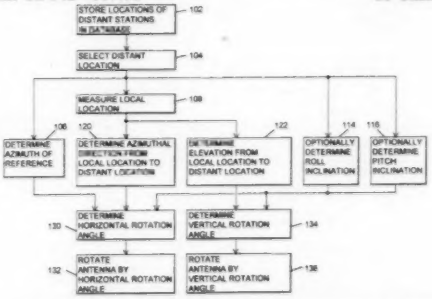
METHOD AND APPARATUS FOR AUTOMATICALLY AIMING AN ANTENNA TO A DISTANT LOCATION

Lea Ann McNabb, Cupertino, and David R. Gildea, Menlo Park, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Dec. 17, 1998, Appl. No. 215,185

Int. Cl.[7] **G01S** *5/02*; **H04B** *7/185*

U.S. Cl. 342—357.06 **18 Claims**



1. A method for automatically pointing an antenna to a distant location, comprising steps of:

storing data for said distant location;

determining a reference azimuth for said antenna;

determining a local location;

computing a pointing azimuth from said local location to said distant location;

computing an azimuthal rotation angle between said pointing azimuth and said reference azimuth; and

rotating said antenna to said azimuthal rotation angle with respect to said reference azimuth for pointing said antenna to said distant location.

6,016,121

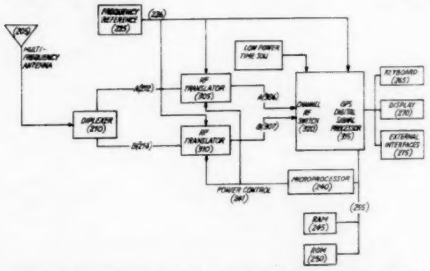
MULTIPLE FREQUENCY GPS RECEIVE OPERATION USING SINGLE FREQUENCY SEQUENCING

Erik F. Bogensberger; Matthew L. Burns, and Jeffery C. Rambo, all of Cedar Rapids, Iowa, assignors to Rockwell Collins, Inc., Cedar Rapids, Iowa

Filed Oct. 9, 1998, Appl. No. 169,623

Int. Cl.[7] G01S *5/03*

U.S. Cl. 342—357.12 **12 Claims**



1. A method of tracking both first global positioning signals at a first frequency and second global positioning signals at a second frequency different than the first frequency using a global positioning system (GPS) receiver having an intermediate frequency or frequencies input to channels of a digital signal processor adapted to generate a navigation solution, the method comprising:

receiving both of the first global positioning signals and the second global positioning signals;

separating the first global positioning signals having the first frequency from the second global positioning signals having the second frequency;

translating the first global positioning signals having the first frequency and the second global positioning signals having the second frequency into first and second translated global positioning signals, respectively, having an intermediate frequency or frequencies different than the first and second frequencies; and

controlling sequencing of the first and second translated global positioning signals to selectively provide the first and second translated global positioning signals one at a time to the channels of the digital signal processor for use in navigation solution determination, wherein translating the first and second global positioning signals and controlling the sequencing further includes coordinating power control of multiple RF translators and channel frequency switches used to translate and to selectively couple one at a time the first and second translated global positioning signals to the channels of the digital signal processor for use in navigation solution determination, thereby reducing the power consumption of the GPS receiver.

6,016,122

PHASED ARRAY ANTENNA USING PIEZOELECTRIC ACTUATORS IN VARIABLE CAPACITORS TO CONTROL PHASE SHIFTERS AND METHOD OF MANUFACTURE THEREOF

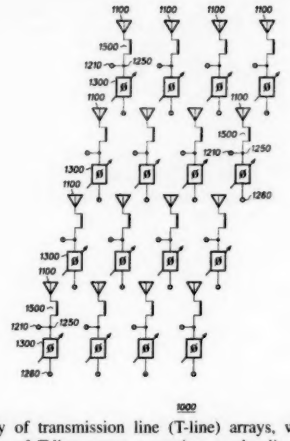
Hugh Robert Malone, Phoenix; Deborah Sue Dendy, Tempe; Dean Lawrence Cook, Mesa, all of Ariz.; James R. Phillips, and Richard S. Kommrusch, both of Albuquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 1, 1998, Appl. No. 88,197

Int. Cl.[7] H01P *1/18*

U.S. Cl. 342—372 **27 Claims**

1. A phased array antenna comprising:



1000

a plurality of transmission line (T-line) arrays, wherein said plurality of T-line arrays comprises a plurality of antenna elements deposited on a first surface of said plurality of T-line arrays, at least one ground plane surface fabricated within at least one of said plurality of T-line arrays, a plurality of second plates deposited on a second surface of said plurality of T-line arrays, and a plurality of T-lines, wherein said plurality of antenna elements is coupled to said plurality of second plates using at least one of said plurality of T-lines;

a distribution network coupled to at least one of said plurality of T-line arrays; and

a plurality of actuator arrays coupled to said plurality of T-line arrays, said plurality of actuator arrays comprising a plurality of first plates coupled to a plurality of piezoelectric actuators, said plurality of piezoelectric actuators being coupled to a plurality of reference surfaces, said plurality of first plates being coupled to said plurality of second plates using at least one dielectric material, wherein a first amount of capacitance is established between a first plate and a second plate, said first amount of capacitance causing a first amount of phase shift,

wherein said plurality of antenna elements is configured into at least one I by J array, said plurality of first plates and said plurality of second plates are configured into at least one K by L array of voltage variable capacitors, wherein I, J, K, and L are positive integers, and wherein a voltage variable capacitor comprises at least one first plate, at least one second plate, and at least one piezoelectric actuator.

6,016,123

BASE STATION ANTENNA ARRANGEMENT

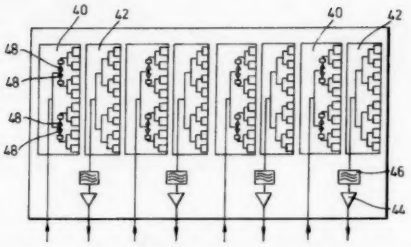
Paul Barton, Torquay; Jeffrey Graham Searle, Nr Brixham; Peter John Chrystie, Brixham, and Keith Russell Edwards, Paignton, all of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of application No. 08/385,911, Feb. 9, 1995, abandoned. This application Jun. 24, 1997, Appl. No. 880,299. Claims priority, application United Kingdom, Feb. 16, 1994, 9402942

Int. Cl.[7] H01Q *3/22;3/24;3/26*

U.S. Cl. 342—373 **10 Claims**

1. An azimuthal beamforming antenna arrangement for a cellular radio base station for receiving uplink signals from and transmitting downlink signals to outstations within an area of coverage of the base station, comprising at least one antenna including several vertically oriented sub-array antennas, the vertically oriented sub-array antennas including means for forming separate substantially coincident beams in azimuth; switching means operable to select any one or more of the vertically oriented sub-array antennas; wherein several vertically oriented sub-array antennas are selec-



tively switchable so that the uplink signals are received by at least two vertically oriented sub-array antennas coupled through cables by respective elevation beamformers to a base station controller.

6,016,124

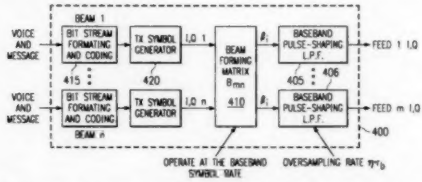
DIGITAL BEAMFORMING IN A SATELLITE COMMUNICATION SYSTEM

Wing Lo, and Jue Chang, both of Plano, Tex., assignors to Nortel Networks Corporation, Richardson, Tex.

Provisional application No. 60/042,797, Apr. 7, 1997. This application Apr. 6, 1998, Appl. No. 55,374.

Int. Cl.[7] H01Q *3/26*

U.S. Cl. 342—373 **3 Claims**



3. A method for performing baseband beamforming in a multi-frequency, multi-beam, beamforming network, the method comprising the steps of:

formatting a plurality of digital signal bit streams to generate a plurality of predetermined digital format signals;

generating a series of symbols, at a baseband frequency, from each of the predetermined format signals;

generating antenna feed signals from each of the plurality of series of symbols; and

generating filtered antenna feed signals from the antenna feed signals by pulse-shaping and low-pass filtering the antenna feed signals.

6,016,125

ANTENNA DEVICE AND METHOD FOR PORTABLE RADIO EQUIPMENT

Nils Anders Johansson, Lund, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Aug. 28, 1997, Appl. No. 919,256

Claims priority, application Sweden, Aug. 29, 1996, 9603136

Int. Cl.[7] H01Q *1/24*

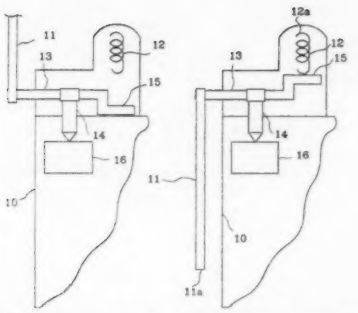
U.S. Cl. 343—702 **14 Claims**

1. Antenna device for a portable radio equipment comprising.

a primary antenna; and

a secondary antenna; wherein

the primary antenna can be placed in a first position and in a second position, characterized in that the primary antenna is connected to a radio circuit of said radio equipment and the secondary antenna is not connected to the radio circuit when the primary antenna is in the first position and that both the primary antenna and the secondary antenna are connected in parallel to the radio circuit when the primary antenna is in the second position.



6,016,126

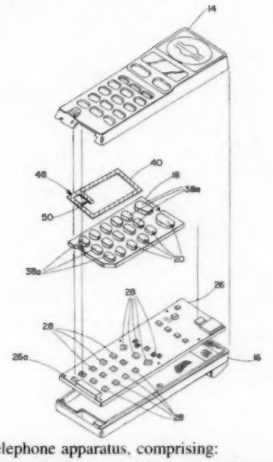
NON-PROTRUDING DUAL-BAND ANTENNA FOR COMMUNICATIONS DEVICE

Howard E. Holshouser, Efland, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed May 29, 1998, Appl. No. 87,598

Int. Cl.[7] H01Q *1/24*

U.S. Cl. 343—702 **23 Claims**



1. A radiotelephone apparatus, comprising:

a housing comprising top and bottom portions, said housing configured to enclose electronic components that transmit and receive radiotelephone communications signals;

a circuit board disposed within said housing, said circuit board comprising a plurality of contact pads on a face thereof;

a keypad comprising a plurality of keys, each key having a first end extending through said housing top portion and a second end operably engageable with a respective contact pad on said circuit board face;

an antenna between said keypad and said housing top portion, said antenna comprising:

a first dielectric substrate comprising a surface that faces away from said circuit board;

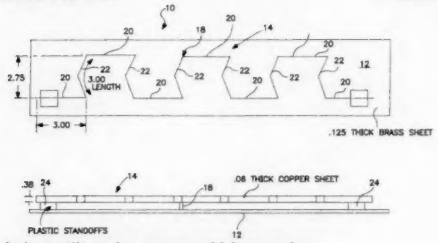
a first radiating element disposed on said first dielectric substrate surface, said first radiating element comprising a first electrically conductive path;

a second dielectric substrate comprising a surface that faces away from said circuit board; and

a second radiating element disposed on said second dielectric substrate surface and parasitically coupled with said first

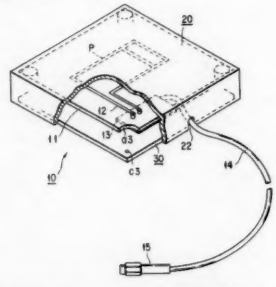
radiating element, said second radiating element comprising a second electrically conductive path.

6,016,127
TRAVELING WAVE ANTENNA
Dean Casciola, Standish, and Michael J. Figoli, Durham, both of Me., assignors to Howell Laboratories, Inc., Bridgton, Me.
Filed Jun. 26, 1996, Appl. No. 669,749
Int. Cl.[7] H01Q *11/02*
U.S. Cl. 343—731 **7 Claims**



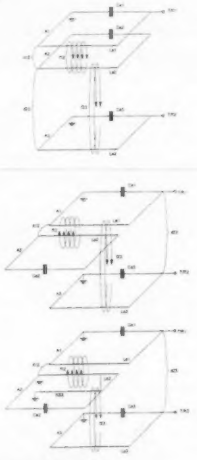
1. A traveling wire antenna which comprises:
a substantially planar ground plane;
at least one insulator;
a flat strip-like radiator having a width and a length spaced above the ground plane, the plane in which the flat strip-like radiator lies being substantially parallel to the ground plane, the flat strip-like radiator being electrically isolated from the ground plane and supported by the insulator, the width of the flat-strip like radiator being substantially perpendicular to the ground plane, the radiator comprising a plurality of arms sequentially joined at their ends to define an angular relationship between adjacent arms, the length of the arms and the angles at which the arms are joined to one another, together provide a desired radiation pattern; and
means for feeding power to the radiator.

6,016,128
GPS WAVE ANTENNA APPARATUS
Yutaka Imamura, Yokohama; Tatsuaki Taniguchi, and Kazuo Shigeta, both of Hiroshima-ken, all of Japan, assignors to Harada Industry Co., Ltd., Tokyo, Japan
Filed Sep. 2, 1998, Appl. No. 145,590
Claims priority, application Japan, Sep. 4, 1997, 9-239641
Int. Cl.[7] H01Q *11/12;7/00;1/42*
U.S. Cl. 343—741 **5 Claims**



1. A GPS wave antenna apparatus comprising:
a resinous case shaped like a shallow box having an opening of an entirety of one surface area perpendicular to a depth direction;
a substrate unit having a printed board which is detachably contained in an innermost portion of the resinous case through the opening, an antenna constituting element including a GPS wave antenna element having a thin-film conductive pattern being mounted integrally as one component on the printed board; and
a conductive plate attached to the case so as to cover the opening and arranged opposite to the substrate unit at a fixed distance therebetween, the conductive plate being parallel at least to the GPS wave antenna element.

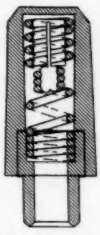
6,016,129
ANTENNA SYSTEM, IN PARTICULAR AN ANTENNA SYSTEM FOR TRAFFIC COMMUNICATING SYSTEMS
Alfred Lauper, Zürich, Switzerland, assignor to Siemens Schweiz AG, Zurich, Switzerland
PCT No. PCT/CH96/00128, § 371 Date Oct. 14, 1997, § 102(e) Date Oct. 14, 1997, PCT Pub. No. WO96/32755, PCT Pub. Date Oct. 17, 1996
PCT Filed Apr. 11, 1996, Appl. No. 930,607
Claims priority, application Switzerland, Apr. 12, 1995, 1055/95; May 17, 1995, 1443/95; Aug. 29, 1995, 2450/95
Int. Cl.[7] H01Q *21/00;1/32;11/12*
U.S. Cl. 343—867 **21 Claims**



1. An antenna system comprising:
a first antenna connected with at least one of a first transmitter and first receiver unit;
a second antenna which is inductively and mechanically coupled via the first antenna with said at least one of the first transmitter and first receiver unit;
the mutually inductive and mechanically coupled antennas being coupled with a further antenna system having at least one third antenna connected with at least one of a second transmitter and second receiver unit for at least one of the transmission of data and for the reception of data from said at least one of the first transmitter and first receiver unit; and
the first, second and at least one third antenna have a resonant frequency of at least approximately a value fm.

6,016,130
DUAL-FREQUENCY ANTENNA
Petteri Annamaa, Oulu, Finland, assignor to LK-Products Oy, Kempele, Finland
Filed Aug. 21, 1997, Appl. No. 915,953
Claims priority, application Finland, Aug. 22, 1996, 963275
Int. Cl.[7] H01Q *1/24*
U.S. Cl. 343—895 **35 Claims**

1. An antenna for the transmission and reception of radio-frequency oscillation in two frequency ranges, comprising:



a cylindrical coil conductor forming a helical antenna and having a longitudinal axis, said cylindrical coil conductor including a first portion and a second portion, said first and second portions being disposed along said longitudinal axis; and

a second antenna element fixedly connected to said cylindrical coil conductor at a junction disposed between said first and second portions of said cylindrical coil conductor, said second antenna element being oriented in the same direction from said junction as said second portion of said cylindrical coil conductor and a physical length of said second antenna element in said direction is substantially the same as a physical length of said second portion is said direction.

6,016,131

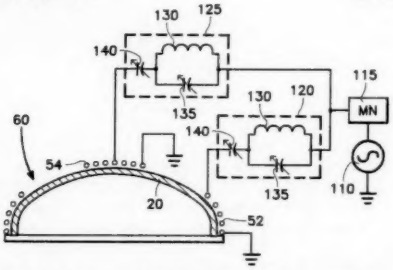
INDUCTIVELY COUPLED PLASMA REACTOR WITH AN INDUCTIVE COIL ANTENNA HAVING INDEPENDENT LOOPS

Arthur H. Sato, Santa Clara, and Xue-Yu Qian, Milpitas, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of application No. 08/515,695, Aug. 16, 1995, Pat. No. 5,907,221. This application May 3, 1999, Appl. No. 305,091.

Int. Cl.[7] **H01Q** *1/36*

U.S. Cl. 343—895 **63 Claims**



1. An inductively coupled plasma reactor for processing a substrate in a reactor chamber containing a process gas, comprising:

an inductively coupled coil antenna, said coil antenna comprising plural inductive antenna loops adjacent different portions of said chamber and which are electrically separate from one another;

plural RF impedance match networks each connected to respective ones of the antenna loops;

plural RF power level adjusting circuits each connected to a respective one of the RF match networks and being capable of changing and setting an RF power level;

an RF power distribution controller connected to each of the RF power level adjusting circuits, said controller being capable of simultaneously controlling each of the RF power level adjusting circuits to individually govern the RF power levels to provide a uniform plasma ion density distribution across the top surface of the substrate.

6,016,132

GRADATION CONTROLLED LED DISPLAY DEVICE AND METHOD FOR CONTROLLING THE SAME

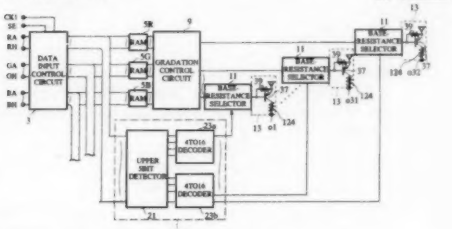
Nozomu Takahashi, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Jan. 15, 1998, Appl. No. 7,765

Claims priority, application Japan, Jan. 22, 1997, 9-009746

Int. Cl.[7] **G09G** *3/32;5/10*

U.S. Cl. 345—82 **20 Claims**



1. An LED display device comprising:

(a) an LED array having a matrix of LED chips;

(b) a data input control circuit for receiving display data, each piece of the display data being composed of a plurality of bits;

(c) a gradation control circuit for controlling the lighting times of the LED chips according to the display data so that the LED chips may provide gradation levels corresponding to the lighting times;

(d) a data driver having at least transistors for driving a predetermined number of the LED chips according to the lighting times;

(e) a base current control circuit for determining base currents supplied to the transistors of the data driver according to the display data; and

(f) a scan circuit for scanning the predetermined number of the LED chips at a time, whenever the data driver drives the predetermined number of the LED chips.

6,016,133

PASSIVE MATRIX ADDRESSED LCD PULSE MODULATED DRIVE METHOD WITH PIXEL AREA AND/OR TIME INTEGRATION METHOD TO PRODUCE CORAY SCALE

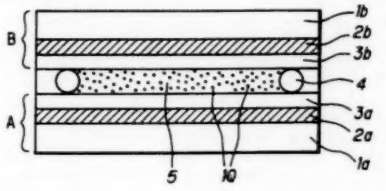
Keiichi Nito; Akio Yasuda, both of Tokyo; Hidehiko Takanashi, Kanagawa, and Ying Bao Yang, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 23, 1994, Appl. No. 347,245

Claims priority, application Japan, Nov. 30, 1993, 5-325850

Int. Cl.[7] **G09G** *3/36;5/10;* **C09K** *19/02*

U.S. Cl. 345—89 **16 Claims**



1. A method of driving a liquid crystal display comprised of a ferroelectric liquid crystal disposed between a pair of substrates, said liquid crystal comprising grains having a diameter of less than 400 nm added to the liquid crystal and finely distributed domains having a range of threshold voltages, said liquid crystal having reversed domains which yield a transmittance of 25% when 300 or more of said domains 2 μm or more in diameter are distributed in a viewing area of 1 mm^2, a single domain having a threshold

voltage which ranges over 2 volts in correspondence with a change in transmittance of from 10 to 90%, said method comprising the steps of:

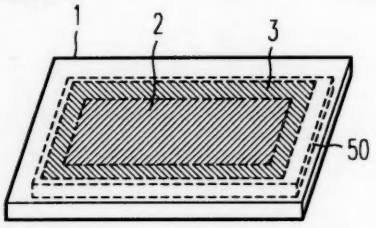
applying a modulated data signal to a data electrode in synchronization with application of an addressing signal to a scanning electrode, said data signal having its pulse voltage or pulse width or both of the pulse voltage and pulse width modulated in correspondence with a gray scale of the pixel.

6,016,134

LIQUID CRYSTAL DISPLAY DEVICE HAVING A TRANSPARENT INPUT TOUCH PANEL

Yuichi Ota, Hadano, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1997, Appl. No. 816,425
Claims priority, application Japan, Mar. 14, 1996, 8-085675
Int. Cl.[7] G09G *3/36*
U.S. Cl. 345—104 **17 Claims**



1. In a liquid crystal display device having a transparent input touch panel provided on a liquid crystal display panel, the improvement comprising:

a transparent sheet layer in the region corresponding to an effective area of the transparent input touch panel and the picture element area of liquid crystal display panel between the transparent input touch panel and the liquid crystal display panel; and

at least one of a cohesive sheet layer and an adhesive sheet layer of coherent strength larger than that of said transparent sheet layer provided in the plane of the transparent sheet layer around at least a portion a periphery of the transparent sheet layer.

6,016,135

BAR CODE READING INSTRUMENT AND SELECTIVELY ORIENTABLE GRAPHICS DISPLAY WHICH FACILITATES THE OPERATION OF THE INSTRUMENT

Charles E. Biss, 4134 Prospect St., P.O. Box 232, Williamson, N.Y. 14589-0232; Andrew Longacre, Jr., 21 Leitch St., Skaneateles, N.Y. 13153, and L. Michael Hone, 1224 Stockbridge Rd., Webster, N.Y. 14580

Continuation of application No. 07/773,488, Oct. 9, 1991, abandoned. This application Apr. 12, 1993, Appl. No. 46,512.
Int. Cl.[7] G09G *5/34*
U.S. Cl. 345—126 **4 Claims**

1. A graphic display system comprising:

(a) display means having a matrix of elements switchable between light and dark states from which elements images of characters are formed, said matrix of elements being disposed about a longitudinal axis and said display means having rotation symmetric about said axis;

(b) means for generating data signals representing said characters, said generating means including a memory having storage for said data signals;

(c) graphic driver means operated by said data signals for selectively changing the elements of said display means between said light and dark states for presenting said characters selectively in upright or inverted orientation and in

reverse sequence when inverted, such that a message containing said characters can be presented in right- or left-handed orientations and in upright or inverted orientation, said driver means being operative to present said characters in the same orientation and sequence when said characters are flipped in opposite directions to positions 180° displaced from each other symmetrically about said axis, wherein said driver means comprises means for converting said data signals corresponding to said characters to light and dark states of said elements to form said characters in said matrix, and said converting means comprises means providing an array of data signal storage cells corresponding to said matrix of elements;

(d) means for reading said data signals from said memory into said array of storage cells for storing said data signals for said characters in the upright position or in the inverted position in reverse sequence; and

(e) means for mapping said data signals in said cells to the matrix of elements of said display means in locations corresponding to the orientation and sequence of said characters in said array of data storage cells;

wherein said elements are disposed in first and second pluralities of areas in first and second rows between which said axis extends such that said rows are on opposite sides of said axis and other graphic symbols are disposed in third and fourth pluralities of areas in rows spaced on opposite sides of said axis, said first and third pluralities of areas being disposed in mirror-wise symmetric relationship with said second and fourth pluralities of areas with respect to said axis.

6,016,136

CONFIGURING AUDIO INTERFACE FOR MULTIPLE COMBINATIONS OF MICROPHONES AND SPEAKERS

Frank Fado, Highland Beach; Peter Guasti, Coral Springs; Amado Nassiff, Boynton Beach, and Ronald VanBuskirk, Indiantown, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1997, Appl. No. 960,516
Int. Cl.[7] G06F *15/00*
U.S. Cl. 345—133 **6 Claims**

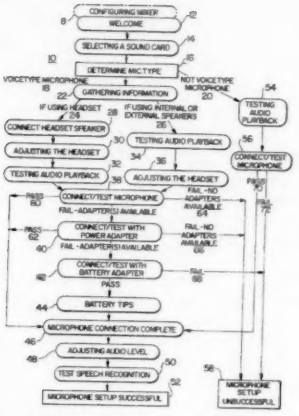
1. A method for configuring an audio interface for a speech recognition application in a computer system, comprising the steps of:

(a) digitally storing representations of pictures of a plurality of audio input and output devices compatible with said computer system, including: a headset with a microphone and an earpiece speaker; a microphone not forming part of a headset; at least one external speaker connected to said computer system; at least one internal speaker connected to said computer system; and, different combinations of said input and output audio devices;

(b) displaying a sequence of graphical user interface (GUI) displays for:

(1) selecting an audio input device and an audio output device;

(2) connecting said selected audio output device;



(3) testing said selected audio output device;

(4) connecting a microphone;

(5) testing said connected microphone; and,

(6) testing said speech recognition application; and,

(c) during each of said steps (b)(1) through (b)(6), including in said sequence of said GUI displays pictures of said selected input and output audio devices.

6,016,137

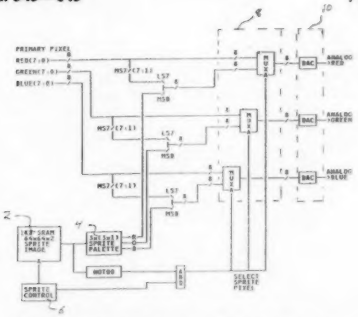
METHOD AND APPARATUS FOR PRODUCING A SEMI-TRANSPARENT CURSOR ON A DATA PROCESSING DISPLAY

Edward Kelley Evans, Essex Junction; Andrew Anthony Long, Winooski, and Roderick Michael Peters West, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1995, Appl. No. 380,762

Int. Cl.[7] G09G *5/08*

U.S. Cl. 345—145 **7 Claims**



1. A method of producing data for displaying a semitransparent video screen cursor in which an underlying image remains visible where said cursor is displayed, comprising the steps of:

a) obtaining video pixel data corresponding to at least one of the red, green, and blue components of each pixel representing said underlying image;

b) halving, at least one time, the numerical value of each datum of said at least one component of said video pixel data;

c) injecting a cursor color value into the most significant bit of each said datum to obtain modified video pixel data by replacing said most significant bit with said cursor color value; and

d) outputting said modified video pixel data.

6,016,138

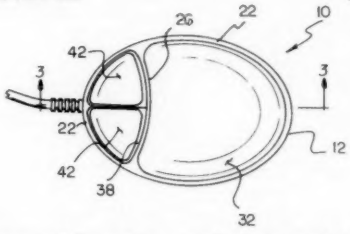
GEL MOUSE

Lisa Harskamp, 1654 Kains St., Berkeley, Calif. 94702; Ali Mahrouyan, 21481 Elm Ct., Cupertino, Calif. 95014, and Steve Jacobsen, 34559 Vane Common, Freemont, Calif. 94555

Filed Oct. 14, 1997, Appl. No. 949,691

Int. Cl.[7] G09G *5/08*

U.S. Cl. 345—163 **3 Claims**



1. A new and improved gel mouse for use in association with a computer comprising, in combination:

a unitary main housing fabricated of a rigid plastic material and having a flat lower surface and a generally spherical upper surface with side walls therebetween to define a lower chamber therewithin, the housing including a peripheral extension wall extending upwardly from the periphery of the housing as an extension of the side walls and a supplemental extension wall within the peripheral extension wall and forming a large upper primary recessed cavity and a button receiving opening;

a large membrane having a periphery secured to the upper regions of the peripheral extension wall and supplemental extension wall and forming the top surface of an upper primary chamber;

a quantity of gel-like fluid within the primary chamber and adapted to change shape of the large membrane from an initial shape to a custom fit shape conforming substantially with the anatomical contours of a user's palm for enhanced comfort and reduced fatigue during use of the computer mouse, said gel-like fluid retaining said custom fit shape for a substantial period of time following release of said use of the computer mouse and thereafter returning substantially to said initial shape;

a pair of buttons positioned within the button receiving opening, each button including an upwardly extending peripheral extension wall to define a secondary recessed cavity;

a pair of button membranes, each button membrane having a periphery secured to the upper regions of a corresponding button peripheral extension wall and forming the top surfaces of a pair of secondary chambers; and

a quantity of gel-like fluid within the secondary chamber and adapted to change shape of the button membranes from an initial shape to a custom fit shape conforming substantially with the anatomical contours of a user's fingers for enhanced comfort and reduced fatigue during use of the computer mouse, said gel-like fluid retaining said custom fit shape for a substantial period of time following release of said use of the computer mouse.

6,016,139

MOTION PICTURE REPRODUCING AND RECORDING/REPRODUCTION APPARATUS

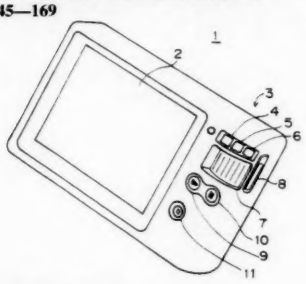
Hideo Terasawa, Kanagawa; Yoshio Kondo, Tokyo; Naoki Nagano, Tokyo, and Kunihito Sawai, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of application No. 08/423,124, Apr. 17, 1995, which is a division of application No. 08/141,627, Oct. 27, 1993, abandoned. This application Sep. 18, 1997, Appl. No. 932,788.

Claims priority, application Japan, Nov. 5, 1992, 4-321259; Nov. 5, 1992, 4-321260; Nov. 5, 1992, 4-321261

Int. Cl.[7] **G09G** *5/08;* **H04N** *5/44*

U.S. Cl. 345—169 **6 Claims**



1. A controller comprising:

a roller member rotatably supported on a shaft, said shaft being arranged so as to be roughly parallel to a longitudinal direction of one of an index finger or a thumb of an operator when the operator holds said controller and the respective one of the operator's index finger or thumb is placed on said roller member for rotating said roller member;

click means operable in a click mode for controlling the rotational position of said roller member at predetermined intervals;

resetting means operable in a resetting mode for resetting said roller member to the predetermined rotational position;

switching means for selecting a desired one of said click means and said resetting means; and

rotation detecting means for detecting the rotation of said controlling member and outputting the results of detection as controlling signals,

wherein said roller member is arranged such that said click means and said resetting means are respectively operable in said click mode and said resetting mode without the use of another roller member.

6,016,140

AUTOMATIC TOUCH SCREEN CALIBRATION

Francois Blouin, and Guillaume Comeau, both of Hull, Canada, assignors to Nortel Networks Corporation, Montreal, Canada

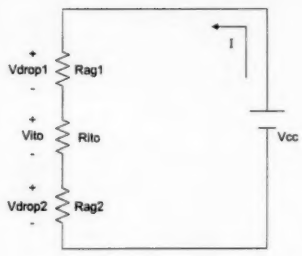
Filed Oct. 29, 1997, Appl. No. 960,218

Int. Cl.[7] **G09G** *3/00*

U.S. Cl. 345—178 **21 Claims**

14. A recalibratable resistive touch screen apparatus comprising a resistive touch screen layer having a first bus bar with a constant resistance Rag**1**, and a second bus bar with a constant resistance Rag**2**, and a conductive layer between the two bus bars having a resistance Rito which is subject to change over time, wherein a voltage Vcc applied across Rag**1**, Rito and Rag**2** results in voltage drops Vdrop**1**, Vito, and Vdrop**2** across respective resistances Rag**1**, Rito and Rag**2**,

an ADC (analog-to-digital converter) connected to produce a raw ADC count representative of a voltage across a portion of Rito and Rag**2** when the conductive layer is touched at a particular point, the raw ADC count being a function of (Vdrop**2**+VB)/Vcc where VB is the voltage across the portion of Rito between Rag**2** and the particular point,



a processing means connected to receive the raw ADC count;

means for initially storing at least one initial parameter which will permit the determination of Rag**1** and Rag**2**;

means for measuring at least one calibration parameter which together with the at least one initial parameter will permit the computation of Vdrop**1** and Vdrop**2**;

wherein the processing means is for using the at least one calibration parameter to create a look-up table which maps a set of said output values, the set being a function of (Vdrop2+VB)/Vcc, onto a corrected set of output values, the corrected set being a function of VB/Vito.

6,016,141

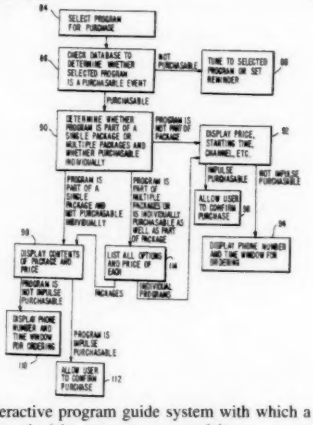
INTERACTIVE TELEVISION PROGRAM GUIDE SYSTEM WITH PAY PROGRAM PACKAGE PROMOTION

Edward B. Knudson, Littleton; Michael D. Ellis, Boulder, both of Colo.; William L. Thomas, Bixby, Okla., and Bruce L. Davis, Lake Oswego, Oreg., assignors to United Video Properties, Inc., Tulsa, Okla.

Filed Oct. 6, 1997, Appl. No. 944,153

Int. Cl.[7] **B04N** *7/445*

U.S. Cl. 345—327 **16 Claims**


84
SELECT PROGRAM FOR PURCHASE
86
CHECK DATABASE TO DETERMINE WHETHER SELECTED PROGRAM IS A PURCHASABLE EVENT
NOT PURCHASABLE
TUNE TO SELECTED PROGRAM OR SET REMINDER
88
PURCHASABLE
90
DETERMINE WHETHER PROGRAM IS PART OF A SINGLE PACKAGE OR MULTIPLE PACKAGES AND WHETHER PURCHASABLE INDIVIDUALLY
PROGRAM IS NOT PART OF PACKAGE
DISPLAY PRICE, STARTING TIME, CHANNEL, ETC.
92
IMPULSE PURCHASABLE
NOT IMPULSE PURCHASABLE
ALLOW USER TO CONFIRM OR PURCHASE
94
PROGRAM IS PART OF A SINGLE PACKAGE AND NOT PURCHASABLE INDIVIDUALLY
PROGRAM IS PART OF MULTIPLE PACKAGES OR IS INDIVIDUALLY PURCHASABLE AS WELL AS PART OF PACKAGE
96
DISPLAY CONTENTS OF PACKAGE AND PRICE
LIST ALL OPTIONS AND PRICE OF EACH
98
PACKAGES
INDIVIDUAL PROGRAMS
DISPLAY PHONE NUMBER AND TIME WINDOW FOR ORDERING
PROGRAM IS NOT IMPULSE PURCHASABLE
DISPLAY PHONE NUMBER AND TIME WINDOW FOR ORDERING
PROGRAM IS IMPULSE PURCHASABLE
100
ALLOW USER TO CONFIRM PURCHASE
112

1. An interactive program guide system with which a user may purchase pay television programs, comprising:

means for selecting a program for purchase from an interactive television program guide;

means for determining whether the selected program is part of a package of pay programs;

means for displaying information on the package of which the selected program is a part when the selected program is part of a package so that the user may decide whether to purchase the package;

means for purchasing the package; and

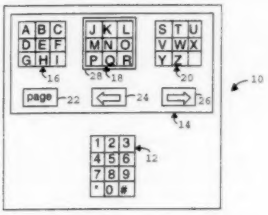
means for determining whether the purchased package contains repetitive programming.

6,016,142

RICH CHARACTER SET ENTRY FROM A SMALL NUMERIC KEYPAD

Shun-Hwa Chang, Fremont, Calif.; Joseph V. R. Paiva, Shawnee, Kans., and Alan Henry Withington, Christchurch, New Zealand, assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Feb. 9, 1998, Appl. No. 20,625
Int. Cl.[7] G06F *3/023*
U.S. Cl. 345—334 **2 Claims**



1. A method for generating alphabetical characters in ASCII-text streams from a numerical keypad with keypads representing "0–9", "*", and #, the method comprising the steps of:

representing every constituent character of an alphabet in corresponding spaces in a set of three side-by-side three-by-three matrices on a display screen connected to a microcomputer;

presenting a "move-left", "move-right", and "page" control button on said display screen near said set of three side-by-side three-by-three matrices;

indicating a "selection choice" for said user by highlighting on said display screen only one of said set of three side-by-side three-by-three matrices;

scanning with said microcomputer a four-by-three numerical keypad with individual keypads representing "0–9", "*", and "#" for any user depression of a keypad, wherein said "*" corresponds to said "page" control button, said "0" corresponds to said "move-left" control button, and said "*" corresponds to said "move-right" control button;

if any keypad was detected as being depressed, testing to see if such keypad represents a "move-left" or "move-right" selection choice by said user, and if so, causing said selection choice to correspondingly move left or right to highlight another one of said three side-by-side three-by-three matrices;

if any keypad was detected as being depressed, testing to see if such keypad represents a "page" selection choice by said user, and if so, causing a different alphabet to be displayed in corresponding spaces in a new set of three side-by-side three-by-three matrices on said display screen; and

if any keypad was detected as being depressed, testing to see if such keypad represents a "1–9", and if so, serially outputting from said microcomputer an ASCII-text stream representing a corresponding one of nine alphabet characters displayed in a highlighted one of said three side-by-side three-by-three matrices on said display screen.

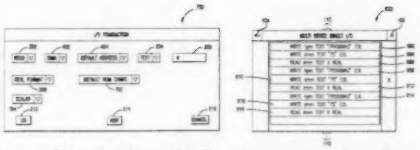
6,016,143

MULTI-DEVICE DIRECT I/O OBJECT THAT GENERATES TRANSACTIONS CAPABLE OF CONTROLLING MULTIPLE INSTRUMENTS AND TRANSACTION DIALOG BOXES HAVING DEVICE AND ADDRESS FIELDS

William Heinzman, Boulder, Colo., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Dec. 29, 1995, Appl. No. 581,118
Int. Cl.[7] G06F *3/00*
U.S. Cl. 345—339 **28 Claims**

1. A Multi-Device Direct I/O object that generates a script for a test set capable of testing a plurality of test instruments, comprising:



means for generating a plurality of transactions from the multi-device direct I/O object that are capable of controlling a plurality of instruments, wherein each transaction contains an instruction for controlling an instrument of the plurality of instruments;

means for generating a plurality of I/O transaction dialog boxes from the multi-device direct I/O object, wherein each dialog box is associated with a corresponding one of said transactions, each said dialog box comprising:

a device field which identifies the instrument to be controlled by said transaction; and

an address field that identifies the address of the instrument to be controlled by said transaction; and

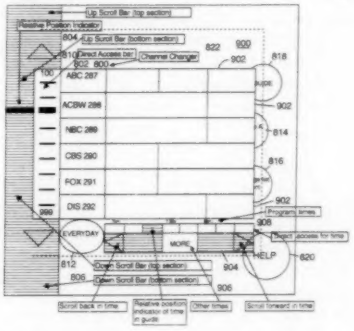
means for generating a script within the multi-device direct I/O object for testing the plurality of instruments using the plurality of I/O transaction dialog boxes, wherein each said dialog box maps the instruction for the corresponding one of said transactions to the script.

6,016,144

MULTI-LAYERED TELEVISION GRAPHICAL USER INTERFACE

Steve Blonstein, Palo Alto; Jack Chaney, Gilroy; Donald Gillespie, San Jose, and Eric Wood, Pleasanton, all of Calif., assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Provisional application No. 60/023,904, Aug. 14, 1996. This application Dec. 9, 1996, Appl. No. 762,492.
Int. Cl.[7] H04N *7/173;5/445;5/50*
U.S. Cl. 345—342 **19 Claims**



1. A television (TV) system comprising:

a CPU, and

a TV monitor controlled by said CPU for displaying on a TV screen a TV program guide in a first layer of graphics, and at

least one graphical object in a second layer of graphics underneath said first layer,

wherein the CPU is configured to automatically adjust the size of said TV program guide in accordance with a position of a cursor to expose at least a portion of said graphical object.

6,016,145

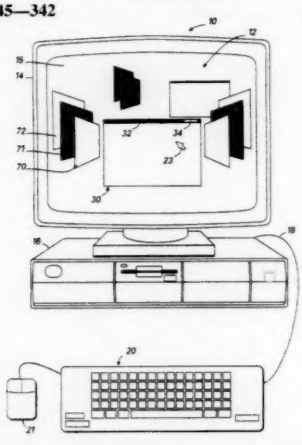
METHOD AND SYSTEM FOR TRANSFORMING THE GEOMETRICAL SHAPE OF A DISPLAY WINDOW FOR A COMPUTER SYSTEM

Eric J. Horvitz, Kirkland; Michael E. Markley, Redmond, and Martin L. Sonntag, Kirkland, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of application No. 08/649,828, Apr. 30, 1996. This application Mar. 4, 1999, Appl. No. 262,108.

Int. Cl.[7] G06F *3/14*

U.S. Cl. 345—342 **13 Claims**



1. In a computer system having an operating system operative to display computer application data in a window on a display monitor, said windows having sides defining an enclosed area for presenting said data on said display monitor, said computer system characterized by resources including a central processing unit (CPU), a memory, and display monitor said resources communicating via a system bus, said CPU operative to control processes for defining the size and shape of displayed windows, a method for resizing sides defining the area of the window, comprising:

defining an isometric work space on said display screen;

displaying a window of information in said isometric work space on said display screen, said window having a first geometrical shape;

providing a first transformation control in said isometric work space, for said display system, for transforming said window of said operating system to a second geometrical shape in said isometric work space; and

upon selection of said first transformation control, transforming said window to said second geometrical shape in said isometric work space, said CPU and said control processes in response to said selection of said first transformation control being capable of performing a three-dimensional transformation of said first geometrical shape to produce said second geometrical shape.

6,016,146

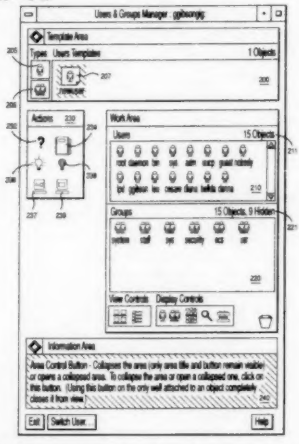
METHOD AND APPARATUS FOR ENHANCING TEMPLATE CREATION AND MANIPULATION IN A GRAPHICAL USER INTERFACE

John Carl Beer, Austin, Tex.; Mark Tweed Bowman, Boca Raton, Fla.; Georgia Ann Gibson, Georgetown, Tex.; John Lovgren, Austin, Tex.; Marianne Poythress Radding, Georgetown, Tex., and Julieta Kaoru Yamakawa, Austin, Tex., assignors to International Business Machines Corproation, Armonk, N.Y.

Filed Jul. 27, 1994, Appl. No. 280,907

Int. Cl.[7] G06F *3/14*

U.S. Cl. 345—349 **20 Claims**



1. A method for controlling a computer system, having at least a display, user controls, and processor, to enhance template object manipulation and creation, comprising the computer-implemented steps of:

displaying a template area pane on said display, wherein said template area pane displays only template objects and creates template objects from any object copied into said template area pane; and

in response to copying at least one template object of a specific object class from said template area pane into an empty space within said template area pane, said specific object class having attributes, automatically creating at least one new template object in said template area pane from said at least one template object, wherein said new template object has the attributes of the specific object class.

6,016,147

METHOD AND SYSTEM FOR INTERACTIVELY DETERMINING AND DISPLAYING GEOMETRIC RELATIONSHIPS BETWEEN THREE DIMENSIONAL OBJECTS BASED ON PREDETERMINED GEOMETRIC CONSTRAINTS AND POSITION OF AN INPUT DEVICE

Brian D. Gantt, Travis County, Tex., assignor to Autodesk, Inc., San Rafael, Calif.

Continuation-in-part of application No. 08/436,158, May 8, 1995, Pat. No. 5,572,639. This application Nov. 5, 1996, Appl. No. 744,241.

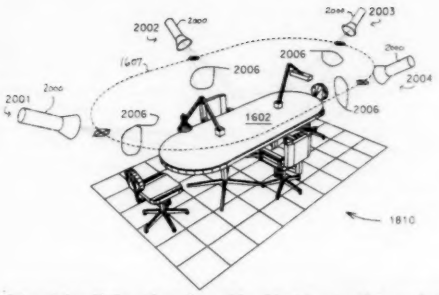
Int. Cl.[7] G06T *15/70*

U.S. Cl. 345—420 **16 Claims**

1. A method of interactively determining geometric relationships between three dimensional objects and displaying the three dimensional objects, comprising the steps of:

detecting the position of an input device;

moving a selected three dimensional graphic object relative to a graphic pointing symbol in a three dimensional representation according to the position of the input device;



determining if the selected graphic object is moved to occlude an underlying three dimensional graphic object in the three dimensional representation;

if the selected graphic object occludes the underlying three dimensional graphic object in the three dimensional representation, dynamically altering a position of the selected graphic object to agree with assembly specifications with respect to the underlying graphic object according to predetermined geometric constraints and the position of the input device; and

dynamically moving the selected graphic object after having been dynamically altered to agree with the assembly specifications according to movement of the input device and the predetermined geometric constraints while the selected graphic object occludes the underlying graphic object.

6,016,148

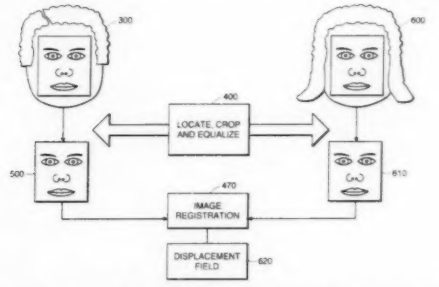
AUTOMATED MAPPING OF FACIAL IMAGES TO ANIMATION WIREFRAMES TOPOLOGIES

Sing Bing Kang, Cambridge, and Keith Waters, West Newton, both of Mass., assignors to Digital Equipment Corporation, Houston, Tex.

Filed Jun. 6, 1997, Appl. No. 870,480

Int. Cl.[7] G06T *15/70;17/20;11/60*

U.S. Cl. 345—425 **6 Claims**



1. A computerized method for mapping a digitized target image of a face to a wireframe topology stored in a memory in a computer system, where the image is composed of a plurality of pixels arranged in a regular pattern, and the wireframe topology is composed of a plurality of nodes connected by lines, comprising the steps of:

detecting a plurality of facial features contained in both the image and wireframe topology;

computing a bounding box from said plurality of detected facial features;

cropping a reference facial image using the bounding box, wherein the reference facial image is a composite image of a plurality of facial images;

cropping the digitized target facial image using the bounding box;

registering the cropped reference facial image with the cropped target facial image to determine a displacement field using a spline-based image registration; and

applying the displacement field to a reference wireframe topology to map the target facial image to the wireframe topology.

6,016,149

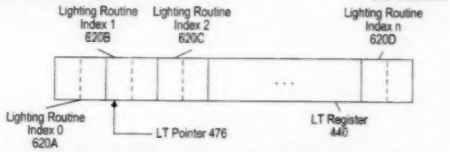
LIGHTING UNIT FOR A THREE-DIMENSIONAL GRAPHICS ACCELERATOR WITH IMPROVED PROCESSING OF MULTIPLE LIGHT SOURCES

Wayne Morse, Fremont, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jun. 30, 1997, Appl. No. 884,687

Int. Cl.[7] G06T *15/50*

U.S. Cl. 345—426 **28 Claims**


Lighting Routine Index 1 620B
Lighting Routine Index 2 620C
Lighting Routine Index n 620D
Lighting Routine Index 0 620A
LT Pointer 476
LT Register 440

1. A graphics accelerator for performing lighting calculations on a first polygon, said graphics accelerator comprising:

an input buffer for receiving attributes corresponding to said first polygon;

a register for storing a table of light source parameters corresponding to a plurality of light sources;

an index storage location configured to store a plurality of index values including a first index value, wherein each index value corresponds to one of the plurality of light sources and provides information as to whether the corresponding light source is used, wherein said first index value is indicative of a first lighting routine to be performed on said first polygon using a first light source;

wherein said plurality of index values provide one or more of the following: an indication that the corresponding light source is not used, an indication that the corresponding light source is directional, an indication that the corresponding light source is infinite, and an indication that there are no additional lights;

an execution unit configured to access a current index value from said index storage location, wherein said current index value is said first index value, and wherein said execution unit is configured to update said current index value to a second index value within said plurality of index values stored in said index storage location, wherein said second index value is indicative of a second lighting routine to be performed on said first polygon using a second light source; and

wherein said execution unit is further configured to perform said first lighting routine upon said first polygon using said first light source.

6,016,150

SPRITE COMPOSITOR AND METHOD FOR PERFORMING LIGHTING AND SHADING OPERATIONS USING A COMPOSITOR TO COMBINE FACTORED IMAGE LAYERS

Jerome E. Lengyel, Seattle, and John Snyder, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

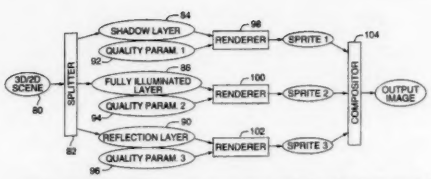
Continuation-in-part of application No. 08/671,412, Jun. 27, 1996, Pat. No. 5,867,166, which is a continuation-in-part of application No. 08/560,114, Nov. 17, 1995, abandoned, which is a continuation of application No. 08/511,553, Aug. 4, 1995, abandoned. This application Jul. 30, 1997, Appl. No. 904,486.

Int. Cl.[7] G06F *15/00*

U.S. Cl. 345—426 **31 Claims**

1. A method for performing shading operations in a graphics rendering system, the method comprising:

factoring terms in a shading model into separate image layers, where the shading model represents a description of shading



to be applied to 3D scene geometry and the shading model is factored over a 3D object or set of 3D objects in the 3D scene geometry;

separately rendering the 3D scene geometry to the separate image layers, where two or more of the layers have different rendering update rates; and

combining the terms of the shading model by compositing the separate image layers using an image operator to combine the rendered image layers into an output image.

6,016,151

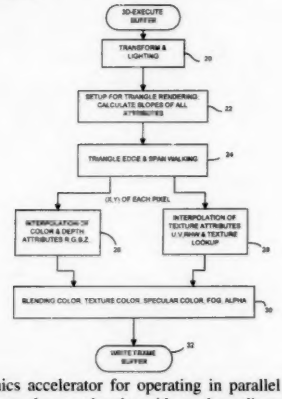
3D TRIANGLE RENDERING BY TEXTURE HARDWARE AND COLOR SOFTWARE USING SIMULTANEOUS TRIANGLE-WALKING AND INTERPOLATION FOR PARALLEL OPERATION

Tao Lin, Fremont, Calif., assignor to NeoMagic Corp., Santa Clara, Calif.

Filed Sep. 12, 1997, Appl. No. 928,291

Int. Cl.[7] G06T *15/60*

U.S. Cl. 345—430 **18 Claims**



1. A graphics accelerator for operating in parallel with a host processor to render a triangle with a three-dimensional (3D) appearance including a 3D texture, the graphics accelerator comprising:

a gradient input, connected to receive gradients of texture attributes from the host processor, the gradients being slopes with respect to x and y coordinate axes for the texture attributes in the triangle being rendered;

a starting-point input, coupled to the host processor, for receiving a starting vertex of the triangle, the starting vertex including x and y coordinates and values for the texture attributes at the starting vertex;

a triangle walker, receiving the starting vertex, for calculating x and y coordinates of pixels within the triangle by incrementing an x coordinate of a pixel on a horizontal line to generate a next pixel on the horizontal line, and by incrementing a y coordinate of a pixel to generate a next pixel on a next horizontal line;

a texture interpolator, coupled to the triangle walker, for interpolating the texture attributes for pixels within the triangle by adding a texture gradient with respect to x to the texture attributes for the pixel on the horizontal line to generate the texture attributes for the next pixel on the horizontal line, and by adding the texture gradient with respect to y to the texture attributes of the pixel to generate the texture attributes for a next pixel on the next horizontal line;

a texture-attribute converter, coupled to receive the texture attributes for each pixel within the triangle, for converting the texture attributes for each pixel to a texture-map coordinate on a texture map;

a texture map, coupled to the texture-attribute converter, containing a matrix of texture pixels accessed by the texture-map coordinate, the texture map outputting a texture pixel when accessed by the texture-map coordinate;

a non-texture pixel input, coupled to the host processor, for receiving color pixels within the triangle, the color pixels having no texture attributes, a color pixel generated by 3D software executing on the host processor in parallel with the graphics accelerator;

a blender, coupled to receive the texture pixel from the texture map and the color pixel from the host processor, both the texture pixel and the color pixel having a same x and y coordinate within the triangle, the blender for combining the texture pixel with the color pixel to produce a composite pixel for the same x and y coordinate; and

a pixel output, coupled to the blender, for outputting the composite pixel to a frame buffer for display on a screen to a user,

whereby the 3D software on the host processor generates the color pixel when the graphics accelerator generates the texture pixel for the same x and y coordinate within the triangle being rendered, whereby the 3D software and the graphics accelerator operate in parallel on a same pixel.

6,016,152

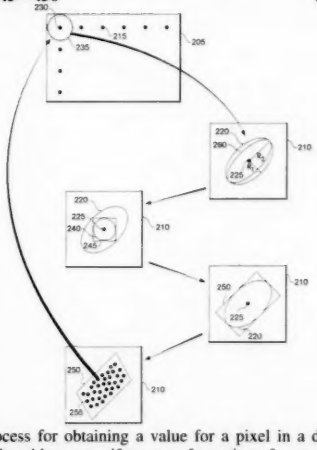
APPARATUS AND METHOD FOR NON-UNIFORM IMAGE SCALING

Garth A. Dickie, Arlington, Mass., assignor to Avid Technology, Inc., Tewksbury, Mass.

Filed Aug. 1, 1997, Appl. No. 904,470

Int. Cl.[7] G06T *11/00*

U.S. Cl. 345—436 **69 Claims**



1. A process for obtaining a value for a pixel in a destination image produced by non-uniform transformation of a source image, comprising the steps of:

selecting a reconstruction filter;

applying an affine transformation determined by the non-uniform transformation on an area centered on the pixel in the destination image to define at least two axes in a source image space;

determining a linear transformation between an area in the source image space and the at least two axes, wherein the linear transformation corresponds to the non-uniform transformation and represents the shape of the area in the destination image transformed by a transformation defined according to

the inverse of the non-uniform transformation, wherein the area is centered around a center of the at least two axes;

modifying the selected reconstruction filter using the linear transformation to create a modified reconstruction filter with a support region;

identifying which pixels from the source image are included in the support region of the modified reconstruction filter; and

determining the value for the pixel in the destination image from pixel centers of the source image included in the support of the modified reconstruction filter.

6,016,153

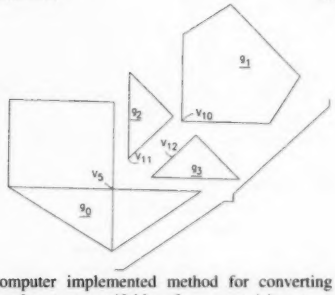
METHOD TO CONVERT NON-MANIFOLD POLYHEDRAL SURFACES INTO MANIFOLD SURFACES

Andre Pierre Gueziec, Mamaroneck, and Gabriel Taubin, Hartsdale, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 08/688,572, Jul. 30, 1996, Pat. No. 5,825,369, Provisional application No. 60/035,014, Jan. 15, 1997. This application Apr. 24, 1997, Appl. No. 840,001.

Int. Cl.[7] **G06F** *15/00*

U.S. Cl. 345—441 **35 Claims**



1. A computer implemented method for converting a non-manifold surface to a manifold surface, comprising steps of:

providing data in a memory of a computer for representing a non-manifold polyhedral surface comprised of a plurality of polygons each bounded by edges and having vertices, the non-manifold polyhedral surface comprising singular vertices and edges;

analyzing the data that represents the non-manifold polyhedral surface to determine and mark the presence of the singular edges and singular vertices; and

cutting through all of the singular edges and singular vertices of the non-manifold polyhedral surface to provide a plurality of connected polyhedral surfaces that are free of singularities.

6,016,154

IMAGE FORMING APPARATUS

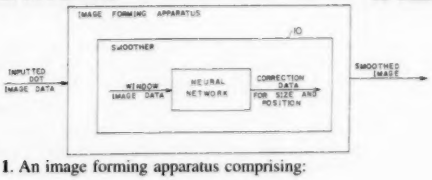
Jun Moroo; Tomohisa Mikami; Masahiro Mori; Hirotaka Chiba; Shigemi Nagata; Shigeyoshi Nakamura; Toshio Konaka, and Kazuhiko Sato, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 10, 1992, Appl. No. 911,741

Claims priority, application Japan, Jul. 10, 1991, 3-170225; Aug. 2, 1991, 3-194423; Aug. 2, 1991, 3-194424

Int. Cl.[7] **G09G** *5/00*

U.S. Cl. 345—442 **53 Claims**



1. An image forming apparatus comprising:

input means for receiving image data, the image data comprising a plurality of input dots of image data, each input dot having a corresponding dot position in a window of a predetermined shape;

jaggedd edge reducing means for reducing jagged edges in the image data said jagged edge reducing means comprising a neural network for receiving image data in a window, the window having a center dot, the neural network outputting correction data, in response to the window image data, correcting the corresponding dot position and size for the center dot in the window based on the correction data, simultaneously generating subdivided dots of each of said input dots subject to reducing jagged edges thereof to reduce a jagged edge present in said image data, and outputting a smoothed image on the correction of the center dot; and

means for replacing said generated subdivided dots for each input dot subject to reducing a jagged edge thereof using the neural network.

6,016,155

CHARACTER PROCESSING APPARATUS, CHARACTER PROCESSING METHOD, AND MEMORY

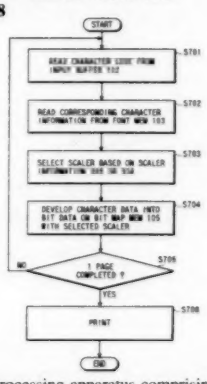
Koou Hiraike, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1996, Appl. No. 638,305

Claims priority, application Japan, Apr. 28, 1995, 7-106198; Apr. 10, 1996, 8-088294

Int. Cl.[7] **G06T** *11/20*

U.S. Cl. 345—468 **23 Claims**



1. A character processing apparatus comprising:

storage means for storing a plurality of kinds of vector font data and a plurality of kinds of scalers for developing said vector font data into character patterns;

input means for inputting character information corresponding to a character to be outputted;

selecting means for selecting the scaler on the basis of the character information inputted by said input means; and

developing means for developing the character pattern of the character information inputted by said input means by using the scaler selected by said selecting means.

6,016,156

IMAGE FORMING APPARATUS

Toshio Urakawa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 10, 1998, Appl. No. 21,636

Claims priority, application Japan, Feb. 24, 1997, 9-038659

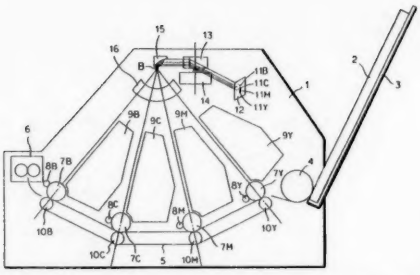
Int. Cl.[7] **B41J** *2/47*

U.S. Cl. 347—134 **4 Claims**

1. An image forming apparatus comprising:

a plurality of image carriers;

a plurality of charging means for charging the respective image carriers;



light beam generating means for generating a plurality of light beams to which the image carriers are exposed so that an electrostatics latent image is formed on each image carrier in accordance with image signals; and

a plurality of developing agent supplying means for supplying a developing agent which develops the electrostatic latent images on the respective image carriers,

the image forming apparatus further comprising:

a scanning mirror for scanning the plurality of light beams from the light beam generating means; and

a reflection mirror for causing the plurality of light beams which are scanned by the scanning mirror, to intersect with each other at one and the same point, and thereafter irradiating the plurality of light beams respectively onto the image carriers.

6,016,157

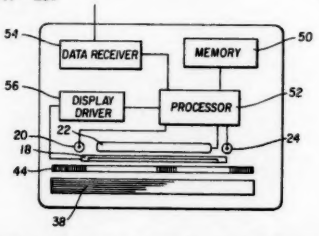
PRINTER USING MULTIPLE LIGHT SOURCES AND MONOCHROME LCD

Stanley W. Stephenson, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1997, Appl. No. 909,985

Int. Cl.[7] G03B *29/00*

U.S. Cl. 347—239 **5 Claims**



1. A liquid crystal device for use in sequentially producing an image composed of three separable color plane images, comprising:

(a) a light diffuser including a sheet of material having a front face and least three sides and which, when light passes through the sides into the diffuser, causes uniform illumination to be produced from the front face;

(b) a liquid crystal display LCD disposed in relationship to the front face of the diffuser to receive light from such front face and responsive to electrical signals corresponding to the image to be produced and light from the diffuser to illuminate the image on the liquid crystal display;

(c) three separate sources of colored light disposed in relationship so that each separate light source corresponds to a different one of the three sides of the diffuser and arranged to sequentially illuminate the LCD; and

(d) means for sequentially producing electrical signals corresponding to separate color planes of the image and the sequential illumination of the three separate colored light sources to sequentially produce the image composed of three separable color plane images.

6,016,158

OBJECT ORIENTED COMMUNICATION NETWORK

Russell D. N. Mackinnon, Knowlton, Canada, assignor to Pelmorex Media Inc., Mississauga, Canada

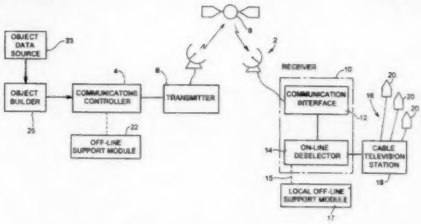
PCT No. PCT/CA94/00505, § 371 Date Jun. 11, 1996, § 102(e) Date Jun. 11, 1996, PCT Pub. No. WO95/08226, PCT Pub. Date Mar. 23, 1995

PCT Filed Sep. 15, 1994, Appl. No. 605,140

Claims priority, application Canada, Sep. 15, 1993, 2106222

Int. Cl.[7] H04N *7/10*

U.S. Cl. 348—7 **11 Claims**



1. A communication system comprising: a transmitter having means for transmitting an object stream comprising a plurality of objects; each of said objects having an identifier or ID which is unique in said communication system and which is independent of the time of transmission of said object; a plurality of receivers each including means for receiving said object stream, and each including means for selecting any of said objects from said object stream; means for providing a receiver profile at each of said receivers independently from said object stream transmission, said transmitter having no means for addressing any of said objects to any of said receivers; each of said receiver profiles comprising a list of objects of interest for one of said receivers said means for selecting being responsive to said profile and said unique ID for selecting objects from said object stream corresponding to objects of interest and for storing said objects of interest; characterized in that said system includes sequencer means for providing a sequence list; said sequence list providing a list of objects of interest which have been stored to be displayed and their respective start times; and means responsive to said sequencer means for assembling, for display as a video signal said objects on said sequence list, in order of their start times.

6,016,159

METHOD AND APPARATUS FOR PRODUCING AND DISPLAYING SPECTRALLY-MULTIPLEXED IMAGES OF THREE-DIMENSIONAL IMAGERY FOR USE IN STEREOSCOPIC VIEWING THEREOF

Sadeg M. Faris, Pleasantville, N.Y., assignor to Reveo, Inc., Elmsford, N.Y.

Continuation of application No. 08/152,020, Nov. 12, 1993, abandoned. This application Sep. 1, 1998, Appl. No. 144,931.

Int. Cl.[7] H04N *13/04*

U.S. Cl. 348—57 **22 Claims**

1. An electro-optical device for selectively transmitting the spectral components of an image having at least first and second groups of spectral components, said electro-optical device comprising:

	FRAME #	SPECTRAL COMPS. IN DISPLAY OUTPUT	POLARIZATION STATE OF SPECT COMP	SPECTRAL COMPS. VIEWED BY LEFT EYE	SPECTRAL COMPS. VIEWED BY RIGHT EYE	V_{OFFSET}
$I_{SHUT}(1,1)$	1	LEFT IMAGE, MAGENTA	P2	LEFT IMAGE, MAGENTA	RIGHT IMAGE, GREEN	0
		RIGHT IMAGE, GREEN	P1			
$I_{SHUT}(2,1)$	2	LEFT IMAGE, GREEN	P2	LEFT IMAGE, GREEN	RIGHT IMAGE, MAGENTA	1
		RIGHT IMAGE, MAGENTA	P1			
$I_{SHUT}(1,2)$	3	LEFT IMAGE, MAGENTA	P2	LEFT IMAGE, MAGENTA	RIGHT IMAGE GREEN	0
		RIGHT IMAGE, GREEN	P1			
$I_{SHUT}(2,2)$	4	LEFT IMAGE, GREEN	P2	LEFT IMAGE, GREEN	RIGHT IMAGE MAGENTA	1
		RIGHT IMAGE, MAGENTA	P1			
$I_{SHUT}(1,3)$	5	LEFT IMAGE, MAGENTA	P2	LEFT IMAGE, MAGENTA	RIGHT IMAGE, GREEN	0
		RIGHT IMAGE, GREEN	P1			
$I_{SHUT}(2,3)$	6	LEFT IMAGE, GREEN	P2	LEFT IMAGE GREEN	RIGHT IMAGE, MAGENTA	1
		RIGHT IMAGE, MAGENTA	P1			

an optically transparent input surface through which the first and second groups of spectral components can enter said electro-optical device;

an optically transparent output surface through which the first and second groups of spectral components can exit said electro-optical device;

first means, disposed between said optically transparent input and output surfaces, for imparting a first polarization state P1 to said first group of spectral components;

second means, disposed between said optically transparent input and output surfaces, for imparting a second polarization state P2 to said second group of spectral components; and

third means for selectively transmitting one or both of said first and second groups of spectral components through said optical output surface in response to a control signal provided to said electro-optical device.

6,016,160

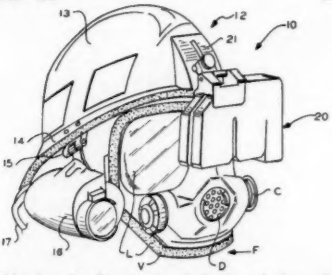
COMBINATION HEAD-PROTECTIVE HELMET AND THERMAL IMAGING APPARATUS

Christopher E. Coombs, Boonton; Robert J. Richter, Cranbury; Richard M. Peel, Gibbstown, all of N.J., and Andrew J. Fordham, Roswell, Ga., assignors to Cairns & Brother Inc., Clifton, N.J.

Continuation of application No. 08/042,044, Mar. 31, 1993. This application Jan. 12, 1999, Appl. No. 228,849.

Int. Cl.[7] **H04N** *7/18;9/47;* **A61B** *1/04*

U.S. Cl. 348—61 **21 Claims**



1. Combination head-protective helmet and thermal imaging apparatus, for being worn by a person in a heated environment where stratified heat is present which increases vertically, comprising:

a head-protective helmet including a cap and a brim circumscribing said cap and extending downwardly and outwardly from said cap sufficiently to provide an envelope of reduced heat under said brim upon said head-protective helmet being present in said stratified heat;

thermal imaging apparatus including an infrared sensor camera for producing an infrared image of a scene or object and display apparatus which generates a visible image of said scene or object from said infrared image for viewing by the eyes of a person wearing said combination;

first mounting means for mounting said camera to said head-protective helmet substantially underneath said brim to protect said camera from falling objects striking said helmet and to cause said camera to substantially reside in said envelope of reduced heat to reduce the influence of said heated environment on said camera, said first mounting means mounting said infrared sensor camera to said head-protective helmet to locate said infrared sensor to the side of the face of said person wearing said combination; and

second mounting means for mounting said display apparatus to said helmet in a position to permit the eyes of said person to see said visible image.

6,016,161

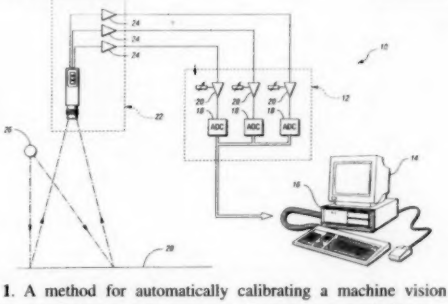
METHOD AND SYSTEM FOR AUTOMATICALLY CALIBRATING A COLOR-BASED MACHINE VISION SYSTEM

David A. Robinson, Northants, United Kingdom, assignor to Medar, Inc., Farmington Hills, Mich.

Continuation-in-part of application No. 08/591,130, Jan. 25, 1996. This application Apr. 1, 1998, Appl. No. 53,595.

Int. Cl.[7] **H04N** *17/00*

U.S. Cl. 348—187 **18 Claims**



1. A method for automatically calibrating a machine vision system including a color camera having output channels for generating a video signal and a computer having a memory wherein the system introduces an offset to the video signal for each channel, the method comprising the steps of:

measuring the offset for each channel;

generating a first set of calibration data based on the offsets;

providing a calibration target having a monotone region of known reflectance;

utilizing the color camera to generate a target image containing the target with the monotone region for each of the output channels;

measuring an output of each of the output channels during the step of utilizing to obtain output measurements;

computing a second set of calibration data from the output measurements and the first set of calibration data; and

storing the second set of calibration data in the memory, the second set of calibration data being applied by the computer to each subsequent image acquired by the color camera on a pixel-by-pixel basis to obtain a color-corrected image.

6,016,162
VIDEO CODING APPARATUS

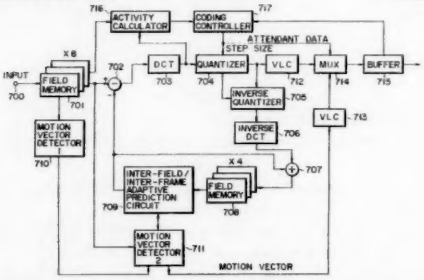
Toshinori Odaka, Yokohama; Yoshiharu Uetani, Kawasaki; Tadaaki Masuda, Tokyo; Tomoo Yamakage, Kawasaki; Hideyuki Ueno, Tokyo; Noboru Yamaguchi, Yashio; Yoshihiro Kikuchi, Yokohama, and Tadahiro Oku, Urayasu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 08/626,922, Apr. 3, 1996, Pat. No. 5,754,231, which is a division of application No. 08/295,421, Aug. 25, 1994, Pat. No. 5,541,661, which is a continuation of application No. 08/156,709, Nov. 24, 1993, Pat. No. 5,424,779, which is a continuation of application No. 07/890,705, May 29, 1992, Pat. No. 5,317,397. This application Apr. 3, 1998, Appl. No. 54,403.

Claims priority, application Japan, May 31, 1991, 3-130012; Oct. 17, 1991, 3-298316; Oct. 17, 1991, 3-298317; Oct. 31, 1991, 3-286855; Feb. 18, 1992, 4-30923

Int. Cl.[7] H04N *7/32*

U.S. Cl. 348—405 **5 Claims**



3. A method of coding a video signal, comprising the steps of:

(a) storing a plurality of local decoded picture signals used as reference picture signals in a memory;

(b) producing a prediction picture signal based on the reference picture signals;

(c) coding an input picture signal corresponding to a picture used for obtaining the reference picture signals or a picture not used for obtaining the reference picture signals, using the prediction picture signal to obtain a coded prediction error signal;

(d) quantizing the coded prediction error signal to obtain a quantized prediction error signal;

(e) variable-length coding the quantized prediction error signal; and

(f) local-decoding the quantized prediction error signal with the prediction picture signal to produce the local decoded picture signals; and wherein

said quantization step quantizes the prediction error signal, which corresponds to each of the local decoded picture signals used as the reference picture signals, with a smaller quantization step size than the prediction error signal corresponding to the picture not used for obtaining the reference signals.

6,016,163
METHODS AND APPARATUS FOR COMPARING BLOCKS OF PIXELS

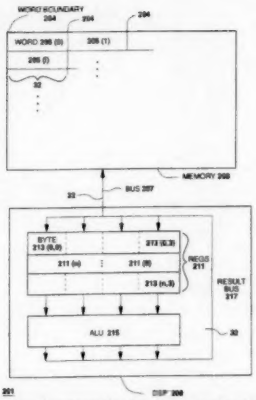
Arturo A. Rodriguez, Norcross; Neilesh R. Patel, Duluth, and Timothy W. Simerly, Cummings, all of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Mar. 12, 1997, Appl. No. 815,259

Int. Cl.[7] H04N *7/12; 11/02; 11/04*

U.S. Cl. 348—420 **19 Claims**

1. In a system including a processing unit, a memory, and a data bus connecting the processing unit and the memory, the system architecture defining, a word size, a method of comparing a first block of pixels with a second block of pixels, tile method comprising the steps of:



according to a fixed pattern that includes a plurality of elements, each of the elements including a number of pixels, the number of pixels corresponding to the word size, the pixels being contiguous in a horizontal direction, the plurality of elements comprising, first elements of a first element type in which pixels are to be compared and second elements of a second element type in which no pixels are to be compared, performing for each first element type in the pattern the steps of

fetching a first element from the first block;

fetching the corresponding first element from the second block; and

comparing pixels in the first element from the first block and corresponding pixels in the first element from the second block.

6,016,164
IMAGE SIGNAL INTERPOLATING APPARATUS

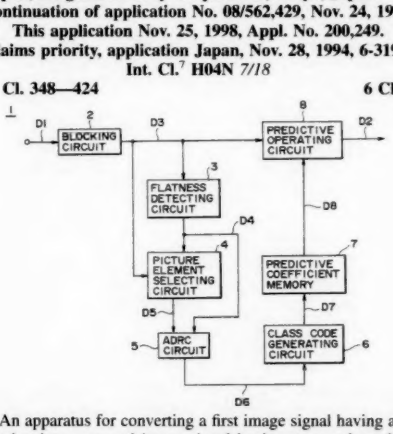
Kunio Kawaguchi, and Tetsujiro Kondo, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of application No. 08/562,429, Nov. 24, 1995. This application Nov. 25, 1998, Appl. No. 200,249.

Claims priority, application Japan, Nov. 28, 1994, 6-319054

Int. Cl.[7] H04N *7/18*

U.S. Cl. 348—424 **6 Claims**



1. An apparatus for converting a first image signal having a first resolution into a second image signal having a second resolution greater than the first resolution by producing pixels of the second image signal in accordance with pixels of the first image signal, said apparatus comprising:

means for detecting an amount of a characteristic near a picture element of the second image signal to be produced using picture elements of the first image signal near the picture element to be produced;

means for selecting surrounding picture elements corresponding to the detected amount of the characteristic, the surrounding

picture elements of the first image signal being adjacent to the picture element of the second image signal to be produced;

means for determining a class corresponding to the picture element to be produced in accordance with the selected surrounding picture elements;

memory having stored therein predicted data for each of a plurality of classes, the predicted data being retrieved from the memory in response to the determined class;

means for producing the picture element of the second image signal to be produced in accordance with the predicted data and

wherein predictive data for each of a plurality of classes is produced by comprising the steps of:

detecting an amount of a characteristic near a picture element to be targeted of the second reference image signal having the second resolution using picture elements of the first reference image signal having the first image signal near a picture element to be targeted, the picture element to be targeted corresponding to a picture element to be produced;

selecting surrounding picture elements corresponding to the detected amount of the characteristic, the surrounding picture elements of the first reference image signal being adjacent to the picture element to be targeted of the second reference image signal;

determining a class corresponding to the picture element to be targeted of the second reference image signal in accordance with the selected surrounding picture elements of the first reference image signal;

determining predicted data for each class by using the first reference image signal and the second reference image signal; and for storing the determined predictive data in the memory.

6,016,165

VERTICAL COMPRESSION CIRCUIT FOR AN IMAGE PLAYBACK SYSTEM

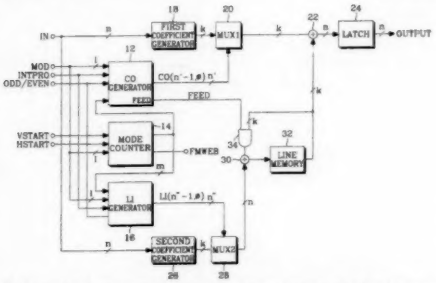
Seung-Ung Baek, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 30, 1997, Appl. No. 865,836

Claims priority, application Rep. of Korea, May 31, 1996, 96/19232

Int. Cl.[7] **H04N** *07/01*

U.S. Cl. 348—441 **11 Claims**



1. A vertical compression circuit for an image playback system displaying an image through interlaced scanning, comprising:

a mode counter for counting horizontal lines within one section of vertical lines based on a compression mode signal and outputting a count;

a coefficient selection signal generating unit for outputting a coefficient selection signal for selecting first and second filtering coefficients and for outputting a feedback control signal, based on the compression mode signal;

a first coefficient selecting unit for generating first coefficients corresponding to various compression modes and outputting one of the first coefficients based on the first coefficient selection signal;

a second coefficient selecting unit for generating second coefficients corresponding to various compression modes and outputting one of the second coefficients based on the second coefficient selection signal;

an adder for adding the second coefficient output from said second coefficient selecting unit to one of zero and a feedback value, based on the feedback signal to produce a sum;

a line memory unit for storing the output from the adder, wherein said adder outputs the second coefficient output from said second coefficient selecting unit if the feedback signal indicates no feedback, and said adder outputs the sum of the second coefficient output from said second coefficient selecting unit and a value previously stored in said line memory if the feedback signal indicates feedback; and

a unit for adding the contents of the line memory unit and the output of the first coefficient selecting unit, and outputting a result.

6,016,166

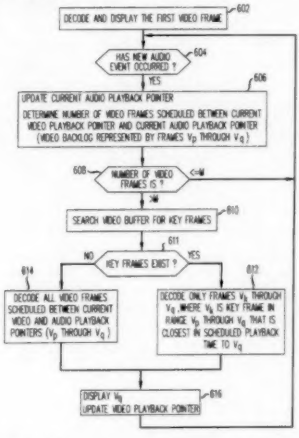
METHOD AND APPARATUS FOR ADAPTIVE SYNCHRONIZATION OF DIGITAL VIDEO AND AUDIO PLAYBACK IN A MULTIMEDIA PLAYBACK SYSTEM

Yan Huang, Edison, and Raymond K. Jones, Voorhees, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 31, 1998, Appl. No. 144,161

Int. Cl.[7] **H04N** *9/475*

U.S. Cl. 348—515 **15 Claims**


DECODE AND DISPLAY THE FIRST VIDEO FRAME
602
HAS NEW AUDIO EVENT OCCURRED ?
604
YES
606
UPDATE CURRENT AUDIO PLAYBACK POINTER
DETERMINE NUMBER OF VIDEO FRAMES SCHEDULED BETWEEN CURRENT VIDEO PLAYBACK POINTER AND CURRENT AUDIO PLAYBACK POINTER (VIDEO BACKLOG REPRESENTED BY FRAMES Vp THROUGH Vq)
608
NUMBER OF VIDEO FRAMES IS ?
<=M
>M
610
SEARCH VIDEO BUFFER FOR KEY FRAMES
611
NO
KEY FRAMES EXIST ?
YES
614
DECODE ALL VIDEO FRAMES SCHEDULED BETWEEN CURRENT VIDEO AND AUDIO PLAYBACK POINTERS (Vp THROUGH Vq)
612
DECODE ONLY FRAMES Vk THROUGH Vq WHERE Vk IS KEY FRAME IN RANGE Vp THROUGH Vq THAT IS CLOSEST IN SCHEDULED PLAYBACK TIME TO Vq
DISPLAY Vq (UPDATE VIDEO PLAYBACK POINTER)
616

1. A method, for use in a multimedia playback system that decodes and renders a combined sequence of encoded audio and video information, for reducing playback disruptions, said method comprising the steps of:

granting priority to decoding and rendering said audio information;

monitoring the rendering of decoded audio and video information to determine whether it is backlogged relative to the rendering of said audio information; and

when said video information is backlogged, reducing said video backlog by

decoding only the backlogged video information that must be decoded to render the most current video image in the sequence of said backlogged video information,

rendering only said most current video image from said backlog, and

discarding all other video information not necessary to produce said most current video image.

6,016,167
METHOD OF COLOR CORRECTING DIGITAL VIDEO DATA

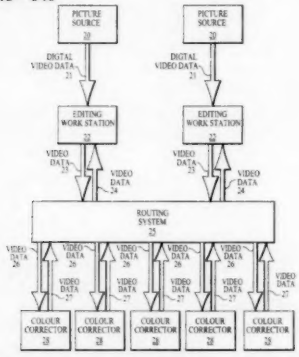
Stephen Brett, Sutton-at-Home, United Kingdom, assignor to Pandora International, Ltd., Kent, United Kingdom

Filed Apr. 14, 1997, Appl. No. 833,215

Claims priority, application United Kingdom, Apr. 12, 1996, 9607651

Int. Cl.[7] **H04N** *9/64;9/68*

U.S. Cl. 348—646 **10 Claims**



1. A method of colour correcting digital video data, comprising the steps of providing a workstation connected to a source of digital video data, analyzing video data at the workstation and making decisions relating to colour corrections to be applied to the video data, generating colour correction parameter data corresponding to the decisions, transmitting the video data and the corresponding colour correction parameter data to a remote colour processor for applying colour corrections to the digital video data, applying colour corrections to the digital video data in accordance with the correction parameter data, and returning the colour corrected video data from the colour processor.

6,016,168
COLOR CORRECTION DEVICE

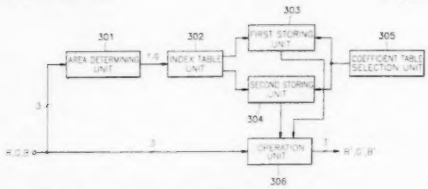
Jin-gu Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 25, 1997, Appl. No. 900,285

Claims priority, application Rep. of Korea, Jul. 25, 1996, 96-30453

Int. Cl.[7] **H04N** *9/67*

U.S. Cl. 348—661 **9 Claims**



1. A color correction device, comprising;

a determining unit which calculates the position of input R, G, and B signals on chrominance axes, and outputs the position as at least two of r, b, and g signals;

an index table unit which uniformly divides the area defined by the chrominance axes into plural positions, and outputs an address corresponding to the position of the R, G, and B signals according to said at least two of r, b, and g signals;

a first memory which stores one or more correction coefficient tables of correction coefficients, corresponding to the plural positions assigned by said index table unit, at designated addresses;

a second memory which stores one or more modification coefficient tables of modification coefficients, corresponding to the plural positions assigned by said index table unit, at designated addresses, each of said modification coefficients tables designating a region corresponding to a color to be strengthened or weakened on the basis of a specific color;

a coefficient table selector which selects a modification coefficient table from said second memory corresponding to a strengthening or weakening of a particular color based on a user adjustment input or which selects a correction coefficient table from said first memory in an absence of a user adjustment input; and

an operation unit which adaptively changes said input R, G, and B signals through a matrix operation using coefficients corresponding to said address output by said index table unit and corresponding to the coefficient table selected by said coefficient table selector and outputting the adaptively changed R, G, and H signals as R', B', and G' signals.

6,016,169
ELECTRONICALLY PROGRAMMABLE FREQUENCY MODULATION CIRCUITS AND RELATED METHODS

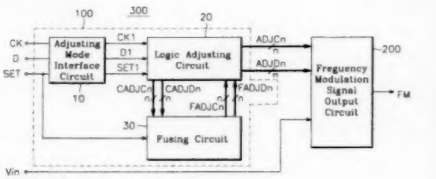
Do-Sang Mok, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Dec. 2, 1996, Appl. No. 753,941

Claims priority, application Rep. of Korea, Nov. 30, 1995, 95-45626

Int. Cl.[7] **H04N** *5/92*

U.S. Cl. 348—724 **15 Claims**



1. A programmable frequency modulation circuit responsive to a video input signal, said frequency modulation circuit comprising:

a programmable control circuit which generates a plurality of sets of control signals in response to a set of test data and mode selection signals, said plurality of sets of control signals comprising switching control signals and fusing selection signals;

a fusing circuit operatively connected to said programmable control circuit which generates a plurality of fusing signals in response to said mode selection signals and said fusing selection signals;

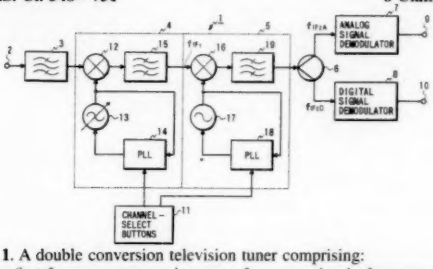
a data selection circuit operatively connected to said programmable control circuit and said fusing circuit being responsive to said mode selection signals wherein said data selection circuit selects and outputs said test data in accordance with said switching control signals during an adjusting mode, and wherein said data selection circuit selects and outputs said fusing signals during a fusing mode in accordance with said switching control signals; and

a frequency modulation signal output circuit connected to said data selection circuit which generates said frequency modulation signal in response to said switching control signals.

6,016,170
DOUBLE CONVERSION TELEVISION TUNER

Akira Takayama, and Michihiro Komatsu, both of Fukushima-ken, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1996, Appl. No. 717,865
Claims priority, application Japan, Sep. 25, 1995, 7-246323
Int. Cl.[7] H04N *5/50*
U.S. Cl. 348—731 **6 Claims**



1. A double conversion television tuner comprising:

a first frequency conversion stage for converting in frequency a channel-select received signal to a first intermediate frequency signal to be output;

a second frequency conversion stage for converting in frequency said first intermediate frequency signal to a second intermediate frequency signal to be output; and

a demodulation stage for demodulating said second intermediate frequency signal;

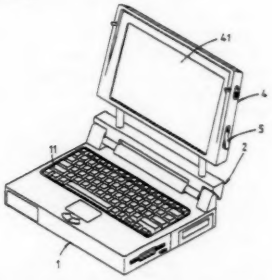
wherein said channel-select received signal has an analog or a digital base-band signal format; and

wherein the local oscillation signal of said second frequency conversion stage is switched to a first frequency or to a second frequency in accordance with the format of the base-band signal, said second frequency being different than said first frequency.

6,016,171
HEIGHT-ADJUSTABLE CASE STRUCTURE FOR THE DISPLAY OF PORTABLE COMPUTERS

Lu-Lung Tsao, Taipei, Taiwan, assignor to Inventec Corporation, Taipei, Taiwan

Filed Mar. 27, 1998, Appl. No. 49,755
Int. Cl.[7] H04B *5/64*
U.S. Cl. 348—836 **4 Claims**



1. A height-adjustable case structure for use on a portable computer having a display, which comprises:

a first case for housing a keyboard and a main circuit board for the portable computer;

a second case for housing a display for the portable computer;

means for hinging said second case on said first case;

at least one guide bar on which said second case is slidably mounted, allowing said second case to be slidable along said guide bar to an elevated position; and

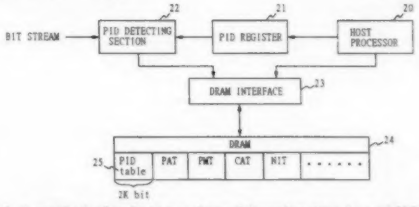
an actuating mechanism mounted on said second case for securing said second case at multiple positions along said guide bar, said actuating mechanism comprises a pivotal member which is pivotally mounted on said second case by a shaft, said pivotal member comprises a pressing portion and has an upper end and a lower end, and an actuating portion which is linked to the pressing portion; and

an elastic member affixed to the upper end of said pivotal member, said elastic member is mounted between an outer wall of said second case and the upper end of the pressing portion causing the actuating portion to engage said guide bar to prevent movement of said second case along said guide bar.

6,016,172
METHOD FOR REDUCING A CHANNEL HOPPING TIME IN AN MPEG-2 SYSTEM DECODER

Jun-Ho Huh, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 13, 1996, Appl. No. 747,316
Claims priority, application Rep. of Korea, Nov. 28, 1995, 95-44331
Int. Cl.[7] H04N *7/18*
U.S. Cl. 348—845.1 **3 Claims**



1. A method of reducing a channel hopping time in an MPEG-2 system decoder, said decoder including a memory section, comprising the steps of:

extracting packet identifier (PID) values from program packets of audio and video signals of each of a plurality of programs contained in a received broadcast signal;

storing said detected PID values in a predetermined storage region of the memory section designated for PID values of the audio and video signals; and

accessing said PID values of said audio and video signals stored in said designated storage region and performing a channel-changing operation in accordance with said accessed PID values in said storage region when a receiving channel is changed.

6,016,173
OPTICS ARRANGEMENT INCLUDING A COMPENSATOR CELL AND STATIC WAVE PLATE FOR USE IN A CONTINUOUSLY VIEWABLE, REFLECTION MODE, FERROELECTRIC LIQUID CRYSTAL SPATIAL LIGHT MODULATING SYSTEM

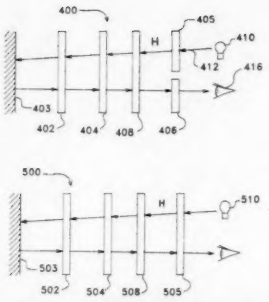
Charles M. Crandall, Tucson, Ariz., assignor to Displaytech, Inc., Longmont, Colo.

Filed Feb. 18, 1998, Appl. No. 25,160
Int. Cl.[7] G02F *1/135;1/1335*
U.S. Cl. 349—25 **15 Claims**

1. A display system for acting on light entering and exiting the system, the display system comprising:

a) a reflective ferroelectric liquid crystal spatial light modulator including an array of pixels, each pixel being switchable between a first pixel state and a second pixel state;

b) a polarizer arrangement including a polarizer for polarizing the light entering the system and directing the polarized light into the spatial light modulator along a first optical path, the reflective spatial light modulator acting on the polarized light to produce an optical output of the spatial light modulator that is directed from the spatial light modulator back into the polarizing arrangement along a second optical path, the polar-



izing arrangement including an analyzer configured to receive and analyze the optical output of the spatial light modulator and to direct the analyzed optical output out of the system as the exiting light; and

c) a compensator positioned in the first optical path between the polarizer of the polarizing arrangement and the spatial light modulator, the compensator being switchable between a first compensator state and a second compensator state such that

(i) during a first case when the compensator is in the first compensator state and one of the pixels of the spatial light modulator is in the first pixel state, the display output corresponding to that pixel is a first optical intensity,

(ii) during a second case when the compensator is in the first compensator state and one of the pixels of the spatial light modulator is in the second pixel state, the display output corresponding to that pixel is a second optical intensity,

(iii) during a third case when the compensator is in the second compensator state and one of the pixels of the spatial light modulator is in the first pixel state, the display output corresponding to that pixel is a third optical intensity, and

(iv) during a fourth case when the compensator is in the second compensator state and one of the pixels of the spatial light modulator is in the second pixel state, the display output corresponding to that pixel is a fourth optical intensity,

the first optical intensity being greater than the second optical intensity and the fourth optical intensity being greater than the third optical intensity, the compensator being configured to function as a wave plate having a retardance of approximately half a wave for visible light during at least one of the four cases.

6,016,174

METHOD FOR MANUFACTURING ELECTRO-OPTIC ELEMENT

Yukio Endo; Nobuhiro Nakamura, and Ikuo Ogo, all of Nishigoshi-machi, Japan, assignors to Advanced Display Inc., Kumamoto, Japan

Filed Mar. 26, 1998, Appl. No. 48,093

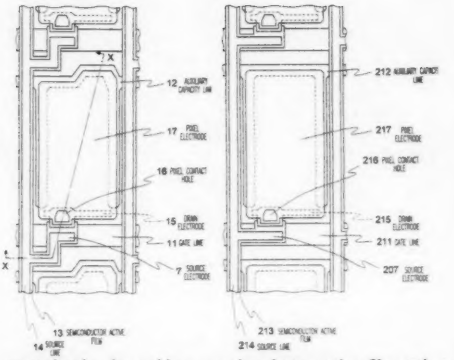
Claims priority, application Japan, Mar. 27, 1997, 9-076297

Int. Cl.[7] G02F *1/136*

U.S. Cl. 349—43 **9 Claims**

1. A method for manufacturing electro-optic elements including a first insulating substrate wherein a display pixel having a pixel electrode in which a TFT is electrically connected is formed as an array, a TFT array substrate wherein a gate line for sequentially scanning each TFT intersects at right angles a source line which provides a signal potential to the pixel electrode, and a second insulating substrate having an opposite substrate on which a color filter and a common electrode are formed, wherein the TFT array substrate and the opposite substrate are affixed with a liquid crystal layer interposed in-between and polarizers are placed at the top of the TFT array substrate and at the bottom of the opposite substrate, respectively, comprising the steps:

forming gate electrodes of the gate line and the TFT by patterning a first metal thin film by a first photolithography process after forming the first metal thin film on the first insulating substrate;



patterning by dry etching a semiconductor active film and an ohmic contact film by a second photolithography process wherein the semiconductor active film and the ohmic contact film are formed in a continuous shape and are larger than a portion in which the source line and the TFT are formed, wherein said patterning step occurs after forming a first insulating film, the semiconductor active film, and the ohmic contact film;

patterning a second metal thin film by a third photolithography process after forming the second metal thin film to form a source electrode and a drain electrode of the source line as well as the TFT and etch-removing by dry etching the ohmic contact film protruding from the source line, the source electrode, and the drain electrode, wherein the source electrode is formed on the gate line of the source line extending from a portion other than intersecting portions between the gate line and the source line;

patterning a second insulating film and the first insulating film in a fourth photolithography process after forming the second insulating film and forming a pixel contact hole that penetrates at least to the drain electrode surface, a first contact hole that penetrates to the first metal thin film surface, and a second contact hole that penetrates the second metal thin film surface; and,

patterning a conductive thin film and forming the pixel electrode by a fifth photolithography process after forming the conductive thin film.

6,016,175

LIQUID CRYSTAL DISPLAY

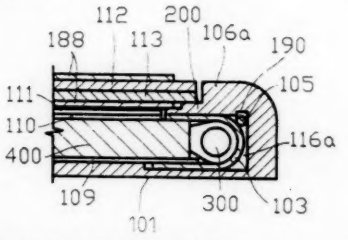
Sung Kon Kim, Kyungsangbook-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Jan. 8, 1998, Appl. No. 4,277

Claims priority, application Rep. of Korea, Jan. 28, 1997, 97-2447

Int. Cl.[7] G02F *1/1333*

U.S. Cl. 349—58 **7 Claims**



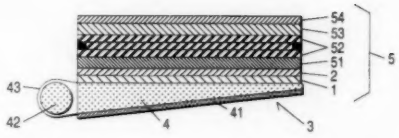
1. A liquid crystal display, comprising:

a back light unit including a light guide and a light reflector;

a liquid crystal display panel including first and second substrates, liquid crystal between the first and second substrates, and switching elements; and

a frame including a bottom portion, a side wall portion, and projecting portions having top and bottom surfaces parallel to the bottom portion for fastening and determining positions of the back light unit and the liquid crystal display panel;

wherein the projecting portions project from the side wall portion of the frame such that the bottom portion, the side wall portion and the projecting portions are formed as one body, the back light unit being received into spaces defined between the bottom surface of the projecting portions and the bottom portion, and the liquid crystal display panel is disposed on the projecting portions and wherein a position determiner for a wire coming from a lamp is formed in one of the spaces between one of the projecting portions and the bottom of the frame.



forming a close contact laminate of two or more cholesteric liquid crystal polymer layers in which an upper layer is different from a lower layer in helical pitch.

6,016,176

LIQUID CRYSTAL DISPLAY DEVICE WITH A FLEXIBLE LIQUID CRYSTAL CELL THAT IS FOLDED

Si-Hwan Kim, Seoul; Kyu-Suk Kim, Kyonggi-do, and Mee-Kyung Kim, Seoul, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Rep. of Korea

Filed Feb. 10, 1999, Appl. No. 247,485

Claims priority, application Rep. of Korea, May 30, 1998, 98-20042

Int. Cl.[7] **G02F** *1/1333*

U.S. Cl. 349—84 **10 Claims**

5. An electronic apparatus comprising:

an LCD device with a liquid crystal cell having at least one flexible portion;

a body portion having front, rear, right and left sides as well as upper and bottom surfaces; and

a coupling member for coupling the LCD device to the body portion,

wherein the surface area of the LCD device is greater than the area of the upper surface of the body portion and the LCD device is bendable in said at least one flexible portion around the front side so as to cover the bottom surface of the body portion.

6,016,177

MULTI-LAYER CIRCULARLY POLARIZED LIGHT SEPARATION PLATE CONTAINING CHOLESTERIC LIQUID CRYSTAL POLYMER LAYERS

Hironori Motomura; Tadayuki Kameyama, and Naoki Takahashi, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed May 29, 1998, Appl. No. 87,162

Claims priority, application Japan, May 29, 1997, 9-157685; Mar. 20, 1998, 10-092766

Int. Cl.[7] **G02F** *1/1335;* **C09K** *19/02*

U.S. Cl. 349—98 **20 Claims**

1. A method for producing a circularly polarized separated plate which comprises coating an oriented cholesteric liquid crystal polymer layer with a different kind of cholesteric liquid crystal polymer that is different from the cholesteric liquid crystal polymer of the oriented layer only in that it has a different ratio of optically active carbon, and heat orienting the resulting coated layer, thereby

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6,016,178

REFLECTIVE GUEST-HOST LIQUID-CRYSTAL DISPLAY DEVICE

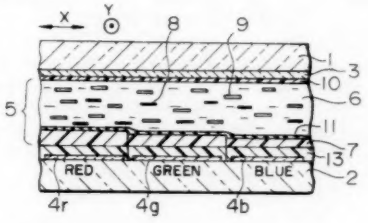
Hideo Kataoka; Nobuyuki Shigeno; Masaki Munakata, and Tetsuo Urabe, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1997, Appl. No. 818,182

Claims priority, application Japan, Sep. 13, 1996, 8-265577

Int. Cl.[7] **G02F** *1/1335;* **C09K** *19/60*

U.S. Cl. 349—117 **9 Claims**



1. A display device comprising:

a transparent substrate positioned on an incidence side;

a reflection substrate spaced apart from the transparent substrate which is positioned on a reflection side and which includes a plurality of pixel electrodes, switching elements for driving each pixel electrode, and a color filter layer patterned in a plane-divided manner in alignment with individual pixel electrodes such that a plurality of first, second and third color filters are associated with respective pixel electrodes;

a guest-host liquid-crystal layer which is held between said transparent substrate and said reflection substrate; and

a plurality of individual phase shifter elements in one-to-one correspondence with individual ones of the plurality of first, second and third color filters.

6,016,179

LIQUID CRYSTAL DISPLAY DEVICE

Hirohide Fukumoto; Junichi Ushirono, both of Kagoshima; Minoru Nakano, and Hideo Kataoka, both of Kanagawa, all of Japan, assignors to Sony Corporation, Japan

Continuation of application No. 08/552,805, Nov. 3, 1995, Pat. No. 5,774,198. This application Jan. 26, 1998, Appl. No. 13,056.

Claims priority, application Japan, Nov. 15, 1994, 6-307033

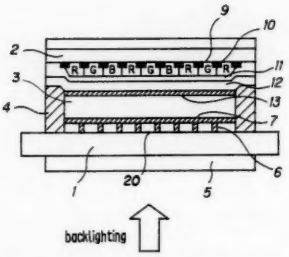
This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G02F** *1/1335;1/1337*

U.S. Cl. 349—128 **17 Claims**

1. A liquid crystal display device comprising:

a first substrate having a plurality of thin film transistors formed in a matrix and a first alignment film provided on an inner surface thereof, said first alignment film having a thickness of 45 nm to 75 nm;



a second substrate opposed to the first substrate and having a second alignment film on an inner surface thereof, said second alignment film having a thickness which is equal to or less than that of said first alignment film and is equal to or less than 50 nm; and

a liquid crystal layer interposed between the first and the second alignment films.

6,016,180

LIQUID CRYSTAL DEVICE

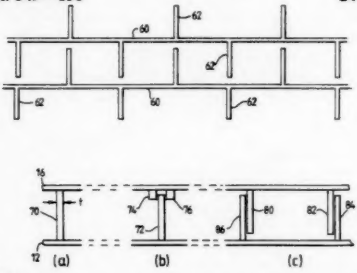
Madeline Joan Bradshaw, Upleadon; John Clifford Jones; Ian Charles Sage, both of Malvern; Damien Gerard McDonnell, Malvern Link, and Paul Anthony Gass, Blackstock Close, all of United Kingdom, assignors to Sharp Kabushiki Kaisha, Osaka, Japan, and The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Hants, United Kingdom

Filed Jul. 24, 1997, Appl. No. 899,440

Claims priority, application United Kingdom, Jul. 26, 1996, 9615778

Int. Cl.[7] **G02F** *1/1339*

U.S. Cl. 349—156 **24 Claims**



1. A liquid crystal device comprising a liquid crystal material contained between two substrates, the substrates having faces carrying electrode structures for addressing a plurality of liquid crystal cells, and a wall structure extending between the two substrates for restricting flow of the liquid crystal material over substantially the whole of the area between the substrates in two mutually transverse directions running parallel to the faces of the substrates, the wall structure comprising a plurality of walls which extend between the substrates and which have respective portions which extend transversely to each of said directions so as to restrict flow of the liquid crystal material in said directions over substantially the whole of the area between the substrates, the walls being spaced apart in such a manner as to define serpentine flow paths for flow of liquid crystal material to the whole of the area between the substrates from a common inlet during filling of the device with liquid crystal material.

6,016,181

LIQUID CRYSTAL DEVICE HAVING COLUMN SPACERS WITH PORTION ON EACH OF THE SPACERS FOR REFLECTING OR ABSORBING VISIBLE LIGHT AND METHOD FOR FABRICATING THE SAME

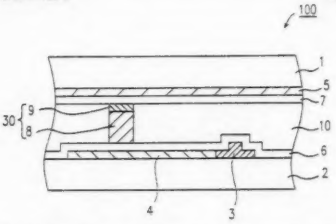
Shinji Shimada, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1997, Appl. No. 955,140

Claims priority, application Japan, Nov. 7, 1996, 8-294271

Int. Cl.[7] **G02F** *1/333;1/1337;1/1339*

U.S. Cl. 349—156 **16 Claims**



1. A liquid crystal device comprising a liquid crystal layer between a pair of substrates,

wherein column-shaped spacers are disposed for controlling a gap between the pair of substrates, and

each of the column-shaped spacers has a portion for substantially controlling the gap between the pair of substrates and a portion for reflecting or absorbing visible light, and the portion for reflecting or absorbing visible light is located at an interface between the spacer and at least one of the pair of substrates.

6,016,182

MOTION PICTURE FILM AND A TECHNIQUE FOR RECORDING AND/OR REPRODUCING DATA FROM SUCH MOTION PICTURE FILM

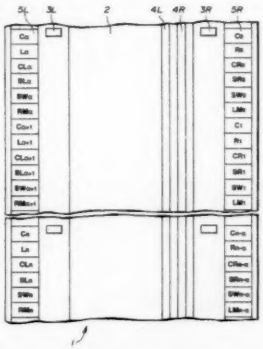
Masakazu Ohashi; Kozo Kaminaga; Kenji Takanashi; Toshiaki Setogawa; Teruyuki Yoshida, and Katsuichi Tachi, all of Kanagawa, Japan, assignors to Sony Cinema Products Corporation, Culver City, Calif.

Filed Dec. 2, 1994, Appl. No. 352,755

Claims priority, application Japan, Dec. 7, 1993, 5-340177

Int. Cl.[7] **G03B** *31/00*

U.S. Cl. 352—37 **17 Claims**



1. A motion picture film comprising first and second digital sound tracks each extending along a film running direction for recording therein coding data and first and second pluralities of bytes of audio data corresponding to a number of frames in predetermined data patterns in the first and second digital sound tracks such that (i) each byte of the recorded audio data which includes a number of bits of data has a size of N bits (wherein N is an integer greater than or equal to 2) in the film running direction

by 1 bit in the direction normal to the film running direction, (ii) first mix data associated with the audio data recorded in the first digital sound track is recorded in the second digital sound track and second mix data associated with the audio data recorded in the second digital sound track is recorded in the first digital sound track, and (iii) the audio data recorded in the first digital sound track pertaining to a respective frame is shifted by an amount corresponding to approximately 17.8 frames as compared to the audio data recorded in the second digital sound track pertaining to said respective frame and in which the coding data includes C1 parity data and C2 parity data.

6,016,183

CONTINUOUS MOTION PICTURE SYSTEM

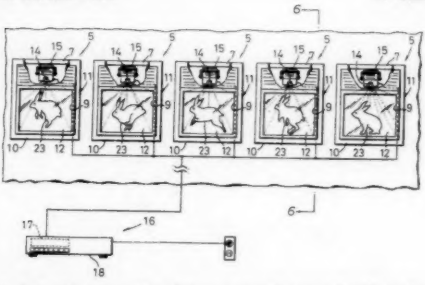
Masaomi Yamamoto, 18-34 Moegino, Aoba-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Sep. 26, 1997, Appl. No. 938,910

Claims priority, application Japan, Feb. 20, 1997, 9-053894; Jul. 15, 1997, 9-207214

Int. Cl.[7] G03B *25/00*

U.S. Cl. 352—100 **17 Claims**



1. A continuous motion picture system for operation in conjunction with a vehicle carrying passengers along a running path, comprising:

screen boxes serially disposed at intervals of a given distance along the running path;

said screen boxes each including a display means with a screen for displaying a still picture for a duration of a display period;

distribution means for supplying picture signals of a sequence of frames, which depict motion when viewed sequentially, to said display means of said screen boxes such that each of said display means receives a respective one of said frames of said sequence of frames in correspondence with the serial disposition of said screen boxes; and

means for sequentially triggering said screen boxes to individually display said respective one of said frames as a still picture for said display period in correspondence with the vehicle passing said screen boxes so as to reproduce said motion when said screen boxes are sequentially viewed by the passengers of the vehicle.

6,016,184

FILING SYSTEM AND REPRODUCTION APPARATUS

Norihisa Haneda, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 13, 1996, Appl. No. 696,062

Claims priority, application Japan, Aug. 24, 1995, 7-237876

Int. Cl.[7] G03B *27/52*

U.S. Cl. 355—36 **2 Claims**

2. A filing system comprising:

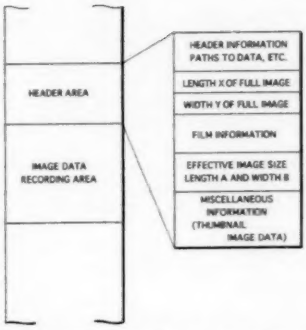

HEADER AREA
IMAGE DATA RECORDING AREA
HEADER INFORMATION PATHS TO DATA, ETC.
LENGTH X OF FULL IMAGE
WIDTH Y OF FULL IMAGE
FILM INFORMATION
EFFECTIVE IMAGE SIZE LENGTH A AND WIDTH B
MISCELLANEOUS INFORMATION (THUMBNAIL IMAGE DATA)

image reading means for reading an image represented on an input medium and generating original digital image data representing the image;

size-data creating means for creating data representing a size of an original image and data representing a size of an effective image using at least the original digital image data obtained by said image reading means;

recording means for recording, in mutually correlated form on a portable recording medium, (a) the original digital image data obtained by said image reading means and (b) the data representing the size of the original image and the data representing the size of the effective image created by said size-data creating means; and

aspect altering means for rewriting the data representing the size of the effective image, which data have been recorded on the recording medium, by new data representing an instructed size for the effective image.

6,016,185

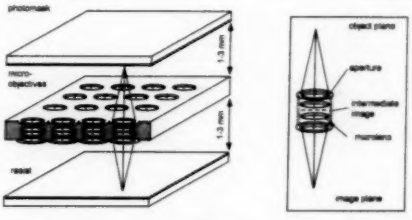
LENS ARRAY PHOTOLITHOGRAPHY

Elmar Cullman, Groebenzel, Germany; Reinhard Völkel, Neuchatel, Switzerland, and Karin M. Wells, Mountain View, Calif., assignors to Hugle Lithography, Sunnyvale, Calif.

Filed Oct. 23, 1997, Appl. No. 956,329

Int. Cl.[7] G03B *27/68;27/42*

U.S. Cl. 355—52 **18 Claims**



1. An apparatus for photolithographic exposure of a substrate comprising:

an illumination source for providing light for producing an image on the substrate;

a mask including a pattern for projection onto the substrate;

a lens assembly disposed between the mask and the substrate and including a plurality of parallel lens channels, the lens assembly projecting the light concurrently through the plurality of parallel lens channels onto the substrate; and

an actuator for moving the lens assembly in a plane parallel to the mask and the substrate for suppressing interference effects.

6,016,186

ALIGNMENT DEVICE AND METHOD WITH FOCUS DETECTION SYSTEM

Shinji Mizutani, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

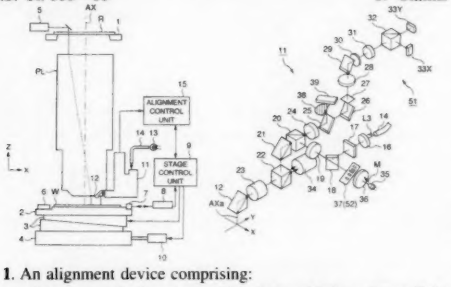
Division of application No. 08/409,403, Mar. 24, 1995, Pat. No. 5,721,605. This application Oct. 20, 1997, Appl. No. 953,980.

Claims priority, application Japan, Mar. 29, 1994, 6-58933

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G03B** *27/42; G01B 11/00*

U.S. Cl. 355—53 **19 Claims**



1. An alignment device comprising:

an objective optical system which is provided to detect light from an alignment mark formed in a mark area on a substrate;

a detection optical system having a detection area within a view field of said objective optical system to detect said alignment mark through said objective optical system; and

a focus detection system which projects any pattern of a plurality of patterns selectively onto said detection area and receives a projected image of the projected pattern through said objective optical system to detect a deviation of said mark area with respect to a focal plane of said detection optical system.

6,016,187

EXPOSURE APPARATUS AND METHOD

Minori Noguchi; Yukio Kenbo, both of Yokohama; Yoshitada Oshida, Fujisawa; Masataka Shiba; Yasuhiro Yoshitaka, both of Yokohama, and Makoto Murayama, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

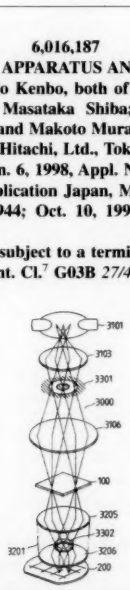
Filed Jan. 6, 1998, Appl. No. 3,141

Claims priority, application Japan, Mar. 5, 1991, 3-038387; Mar. 25, 1991, 3-059944; Oct. 10, 1991, 3-258868; Nov. 29, 1991, 3-315976

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G03B** *27/42*

U.S. Cl. 355—53 **17 Claims**



1. An exposure method comprising the steps of illuminating a pattern on a mask with exposure light and exposing the pattern onto a substrate utilizing a projection system, wherein the step of illuminating the pattern on the mask with the exposure light includes passing the exposure light through a first filter means and a secondary light source producing means so as to illuminate the pattern on the mask, and the step of exposing the pattern onto the substrate includes passing the exposure light after illuminating the pattern on the mask and passing through the mask through a second filter means which is provided at a pupil position of a projection lens of projection optics of the projection system so as to expose the pattern onto the substrate.

6,016,188

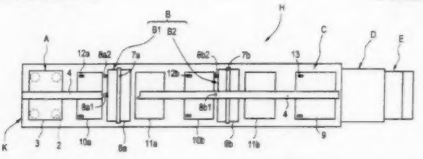
MACHINE FOR MAKING PRINTING PLATES FOR NEWSPAPER PRINTING

Yuichi Okamura, Osaka-fu; Junichi Hosokawa, Chiba-ken, and Takemi Watanabe, Osaka-fu, all of Japan, assignors to Kabushiki Kaisha Kaneda Kikai Seisakusho, Osaka-fu, Japan

Division of application No. 08/914,208, Aug. 19, 1997, Pat. No. 5,887,525. This application Feb. 1, 1999, Appl. No. 241,097.

Int. Cl.[7] **G03B** *27/04;27/22*

U.S. Cl. 355—89 **2 Claims**



1. A machine for making printing plates having a plate feed section (A), an exposure section (B), a plate discharge section (C), and a development section (D) serially arranged along a machine body (K) to form a drawing corresponding to a drawing image signal output from a computer on surfaces of plates (P); wherein:

said plate feed section (A) comprises a stocker case (**1**) for storing a plurality of form plates (P) and a transfer unit (**3**) positioned above said stocker case (**1**) comprising a sucker (**2**) which is movable up and down and a guide rail (**4**) for guiding said sucker to transfer said plates (P) held by said sucker (**2**) along said guide rail (**4**) in a longitudinal direction of the machine body (K);

said exposure section (B) comprises: at least two rotatable exposure barrels (**6***a*, **6***b*) on which said form plates (P) are wound, said exposure barrels being arranged at intervals in the longitudinal direction of the machine body (K), laterally adjacent the plate feed section (A), and being oriented with their rotation axes in the longitudinal direction; a laser-beam scanning head (**8**) for forming drawings on said form plates (P) wound on said exposure barrels (**6***a*, **6***b*); and first tables (**10***a*, **10***b*) respectively provided on sides toward the plate feed section (A) of said exposure barrels (**6***a*, **6***b*) to hold said plates (P) and push them to said exposure barrels (**6***a*, **6***b*); and

said plate discharge section (C) comprises a conveyor system (**14**) laterally adjacent the exposure section (B), but on a side thereof remote from the plate feed section (A), to transfer exposed plates (P) sent from said exposure barrels (**6***a*) and (**6***b*) in the longitudinal direction of the machine body (K);

wherein plates (P) are transferred from said stocker case (**1**) to said first tables (**10***a*, **10***b*) by said transfer unit (**3**) and exposed plates (P) are transferred from said exposure barrels (**6***a*, **6***b*) to said development section (D) by said conveyor system (**14**).

6,016,189

PORTABLE IMAGE FORMING APPARATUS USING PHOTOSENSITIVE RECORDING MEDIUM

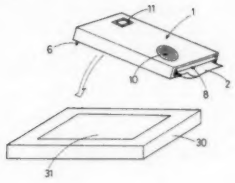
Masashi Ueda, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

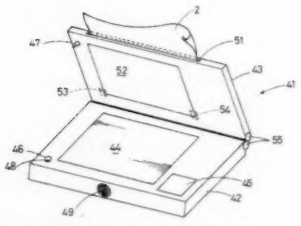
Filed Sep. 23, 1997, Appl. No. 935,823

Claims priority, application Japan, Sep. 25, 1996, 8-253139; Sep. 25, 1996, 8-253149; Sep. 25, 1996, 8-253159

Int. Cl.[7] G03B *27/00*

U.S. Cl. 355—402 **26 Claims**





1. An image forming apparatus comprising:

a main body for storing a photo-sensitive recording medium on which a photosensitive image forming layer is formed;

a contact plane on which an image display arranged in an external apparatus is contacted, the contact plane being formed on the main body;

a control device for controlling light quantity irradiated on the photo-sensitive recording medium from the image display of the external apparatus according to an image displayed thereon, the control device being arranged on the contact plane;

image forming means for forming the image on the photo-sensitive image forming layer on the basis of light irradiated thereon while controlling light quantity by the control device and contacting the image display to the contact plane; and

a detection device for detecting whether the image display is contacting the contact plane.

6,016,190

METHOD AND APPARATUS FOR TRUE TEMPERATURE DETERMINATION

Evgeny Glazman, Haifa, Israel, assignor to 3T True Temperature Technologies, Misgav, Israel

PCT No. PCT/IL96/00102, § 371 Date Mar. 6, 1998, § 102(e) Date Mar. 6, 1998, PCT Pub. No. WO97/11340, PCT Pub. Date Mar. 27, 1997

PCT Filed Sep. 6, 1996, Appl. No. 43,139

Claims priority, application Israel, Sep. 6, 1995, 115192; Apr. 17, 1996, 117951

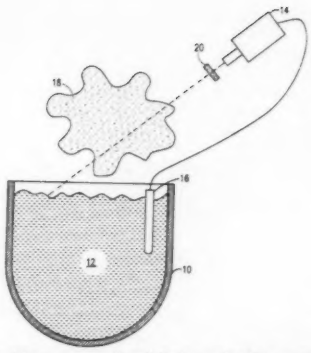
Int. Cl.[7] G01J *5/48;5/60*

U.S. Cl. 356—43 **40 Claims**

1. A method of true temperature determination comprising:

(a) acquiring radiation emission levels respectively from an object at a plurality of wavelengths to form approximations of a true temperature of said object;

(b) determining a characteristic of the acquired radiation which is based on a relationship between said respective radiative emission levels acquired at said plurality of wavelengths;



(c) determining a correctional factor, related to errors in said approximations, by attempting to match the determined characteristic with each of a plurality of stored characteristics, each having an associated correctional factor to, find a matched characteristic, and retrieving the correctional factor associated with the matched characteristic; and

(d) calculating a true temperature of the object by applying said correctional factor to said determined characteristic.

6,016,191

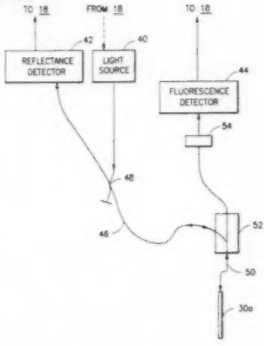
APPARATUS AND TOOL USING TRACERS AND SINGLES POINT OPTICAL PROBES FOR MEASURING CHARACTERISTICS OF FLUID FLOW IN A HYDROCARBON WELL AND METHODS OF PROCESSING RESULTING SIGNALS

Rogerio Tadeu Ramos, Brookfield, Conn., and Kenneth Stephenson, Cambridge, United Kingdom, assignors to Schlumberger Technology Corporation

Filed May 7, 1998, Appl. No. 74,345

Int. Cl.[7] G01N *33/28*

U.S. Cl. 356—70 **20 Claims**



1. An apparatus for analyzing a multiphase fluid flowing in a hydrocarbon well, comprising:

a) injection means for injecting a fluorescent tracer into the flowing fluid, said tracer selected from the group consisting of an oil soluble tracer and a water soluble tracer depending upon the continuous phase of the fluid;

b) a fiber optic probe having two ends, a first end being disposed in the flowing fluid a measured distance "d" downstream of said injection means;

c) a light source having a first wavelength such that said tracer will fluoresce at a second wavelength in response to illumination by said light source, said light source being optically coupled to a second end of said fiber optic probe;

d) light detection means optically coupled to said second end of said probe, said light detection means for detecting light at said second wavelength and for providing a first output signal indicative of detection; and

e) processing means coupled to said injector means and said light detection means, said processing means including actuation means for causing said injection means to inject a volume of said tracer, and timing means for measuring the time between injection of said tracer and detection of said second wavelength by said light detection means.

6,016,192

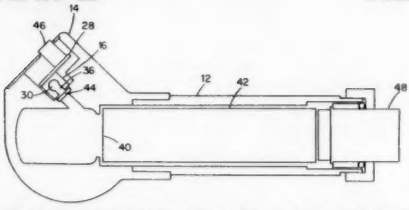
EXTERNAL CALIBRATION SYSTEM FOR A PHOTO MULTIPLIER TUBE

Walter W. Taylor, Dale City, Va., assignor to Dynex Technologies, Inc., Chantilly, Va.

Continuation-in-part of application No. 08/561,636, Nov. 22, 1995. This application Dec. 18, 1997, Appl. No. 992,636.

Int. Cl.[7] G01J *1/10;1/12*

U.S. Cl. 356—229 **6 Claims**



1. An external calibration device for a photomultiplier tube having a light sensitive face comprising:

a reference block having a chamber therein; an elongated light emitting diode having a dome shaped end extending into said chamber; a photo cell mounted in the chamber adjacent said dome, substantially perpendicular to the longitudinal axis of said diode;

mounting means for coupling said block and said tube wherein the longitudinal axis of said diode is contained in a plane disposed at an acute angle to the light sensitive face whereby light from said diode simultaneously strikes said photo cell and the light sensitive face;

circuit means comprising a closed loop feedback circuit coupled between said diode and photo cell and adapted to be coupled to said photomultiplier tube for calibrating the light intensity reading of said tube with the light intensity reading of said photo cell responsive to light from said diode.

6,016,193

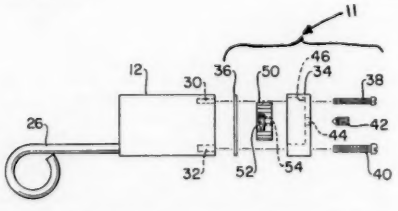
CUVETTE HOLDER FOR COAGULATION ASSAY TEST

Gary Freeman, and Christopher Mauer, both of Palm City, Fla., assignors to Awareness Technology, Inc., Palm City, Fla.

Filed Jun. 23, 1998, Appl. No. 103,094

Int. Cl.[7] G01N *21/47*

U.S. Cl. 356—244 **9 Claims**



1. A device for holding a cuvette in a light path provided by an analytical instrument having a source of air pressure differential, said cuvette containing a magnetic stirring bar to agitate the contents of the cuvette while in the light path, said device comprising:

an upper portion having an opening for receiving and holding the cuvette; and

a lower portion affixed to the upper portion and comprising a rotor housing and a rotor, the rotor having a permanent magnet mounted on a top surface thereof and a plurality of vanes, the rotor being rotatably mounted in the rotor housing;

the rotor housing having a first bore in which the rotor is seated and second and third bores communicating the first bore with the exterior of the device, so that air flow may be induced from an external air pressure differential source across the first bore from the second bore to the third bore, the second and third bores being situated so as to direct the air flow at the plurality of vanes to cause rotation of the rotor within the first bore;

wherein the rotation of the rotor in the rotor housing induces a magnetic field which causes co-rotation of the stirring bar.

6,016,194

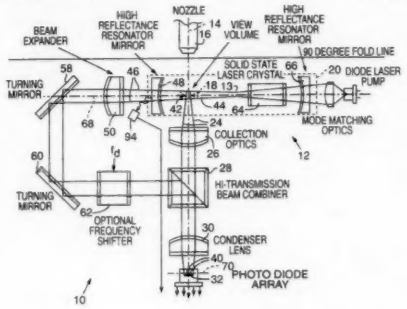
PARTICLES COUNTING APPARATUS AND METHOD HAVING IMPROVED PARTICLE SIZING RESOLUTION

Kenneth L. Girvin, Grants Pass, and Richard K. DeFreez, Azalea, both of Oreg., assignors to Pacific Scientific Instruments Company, Grants Pass, Oreg.

Filed Jul. 10, 1998, Appl. No. 113,986

Int. Cl.[7] G01N *15/02;21/00*

U.S. Cl. 356—337 **18 Claims**



1. An optical scattering method of determining a size of a particle, comprising:

injecting into a view volume having a longitudinal axis target particles having an injection velocity that varies as a function of a position along the longitudinal axis;

propagating coherent radiation having an intensity along the longitudinal axis of the view volume, the radiation exiting the view volume including an unscattered portion of the radiation unscattered by the target particles and a scattered portion of the radiation scattered by the target particles;

detecting with collection optics and an array of photo-detector elements the scattered portion of the radiation, each photo-detector element sensing radiation scattered from one of the positions along the longitudinal axis of the view volume and generating a signal having a magnitude that depends on the intensity of the radiation, the size of the target particle, and the injection velocity of the target particle; and

adjusting a gain associated with each photo-detector element to compensate for the particle injection velocity variations along the longitudinal axis of the view volume so that a gain-adjusted magnitude of each signal represents substantially the size of the particle.

6,016,195

FIBER OPTIC DEVICE FOR DETECTING THE SCATTERED LIGHT OR FLUORESCENT LIGHT FROM A SUSPENSION

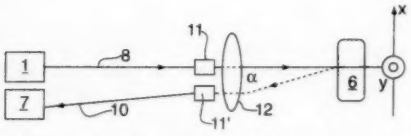
Rainer Peters, Langen, Germany, assignor to ALV-Laser Vertriebsgesellschaft mbH, Langen, Germany

Filed Jun. 15, 1998, Appl. No. 94,777

Claims priority, application Germany, Jun. 15, 1997, 197 25 211

Int. Cl.[7] G01N *21/00*

U.S. Cl. 356—342 20 Claims



1. A fiber optic device for detection of scattered light or fluorescent light from a suspension, comprising:

a lighting optical fiber for transmitting light to a lighting optical fiber outlet;

a first gradient index lens disposed at the lighting optical fiber outlet for parallelizing light;

a detecting optical fiber for transmitting back-scattered light from a detecting optical fiber inlet to a detecting optical fiber outlet;

a second gradient index lens disposed at the detecting optical fiber inlet to parallelize back-scattered light; and

at least one means for focusing parallelized light transmitted from the lighting optical fiber on a point and for focusing light back-scattered from the point to the second gradient index lens of the detecting optical fiber for transmission by the detecting optical fiber.

6,016,196

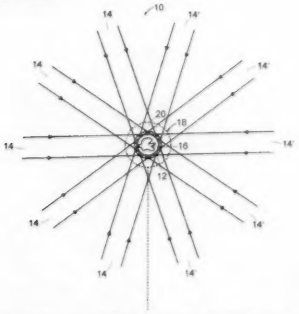
MULTIPLE BEAM PAIR OPTICAL IMAGING

Michael S. Mermelstein, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 17, 1997, Appl. No. 877,519

Int. Cl.[7] G01B *9/02*

U.S. Cl. 356—345 45 Claims



1. A method for providing metrologic information about an object, the method comprising the steps of:

a) providing a plurality of radiation beams;

b) illuminating the object with a modulated interference pattern, the modulated interference pattern comprising a plurality of interference patterns, each of the plurality of interference patterns generated by the interference between pairs of radiation beams in said plurality of radiation beams;

c) detecting a characteristic of the radiation received from the object illuminated by the modulated interference pattern; and

d) calculating metrologic information about the object in response to the modulated interference pattern and in response to the detected characteristic of the radiation received from the object.

6,016,197

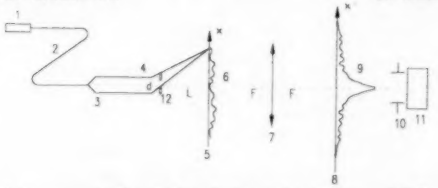
COMPACT, ALL-OPTICAL SPECTRUM ANALYZER FOR CHEMICAL AND BIOLOGICAL FIBER OPTIC SENSORS

Sergej G. Krivoshlykov, Moscow, Russian Federation, assignor to CeramOptec Industries Inc., East Longmeadow, Mass.

Continuation of application No. 08/519,824, Aug. 25, 1995, abandoned. This application Sep. 22, 1997, Appl. No. 934,236.

Int. Cl.[7] G01B *9/02*

U.S. Cl. 356—345 20 Claims



1. A compact, all-optical spectrum analyzer for use with fiber optic chemical sensors and biological sensors comprising:

means of accepting and delivering a signal light beam whose spectrum contains information about a chemical or biological species, being detected, and whose spectrum is to be analyzed;

a beam splitter accepting said signal light beam and splitting it into two output beams of substantially equal intensity and creating a far field interference pattern from said two output beams without using gratings;

an optical means for performing a Fourier transform of a far field interference pattern from said two output beams and projecting said interference pattern as an optical image into a Fourier transform plane;

an optical detector, said detector having means to select at least one section of said optical image within said Fourier transform plane; and

means to analyze said optical image without computer analysis, on a real time scale, and to detect a chemical or biological species.

6,016,198

ELECTRO-OPTIC REFLECTION DEVICE WITH TRAVELING-WAVE STRUCTURE

William K. Burns, Alexandria, Va., and Robert P. Moeller, Fort Washington, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 7, 1997, Appl. No. 966,197

Int. Cl.[7] G01B *9/02*

U.S. Cl. 356—345 14 Claims

1. An interferometer comprising:

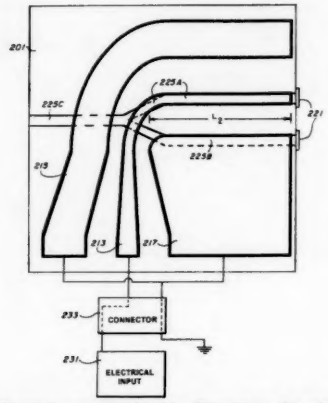
(a) a substrate;

(b) an optical waveguide formed on the substrate; the optical waveguide comprising:

(i) an input/output optical waveguide; and

(ii) a plurality of optical waveguide arms, each of the optical waveguide arms having (I) a near end in optical communication with the input/output optical waveguide and (II) a far end, at least a first one of the plurality of optical waveguide arms having an optical characteristic which varies in accordance with an electric field applied thereto;

(c) reflective means, disposed on the far end of each of the optical waveguide arms, for causing light propagating in said each of the optical waveguide arms toward the distal end to be reflected at the distal end; and



(d) a microwave transmission line disposed on the substrate, the microwave transmission line being open-ended substantially at the distal ends of the plurality of optical waveguide arms and comprising a first electrode disposed on the first one of the plurality of optical waveguide arms to apply the electric field to the first one of the optical waveguide arms.

6,016,199

INTERFEROMETRIC DEVICE FOR PERFORMING SPECTROSCOPIC MEASUREMENTS WITH A STEPPED FABRY PEROT

William Newton, Moorkamp 57, 30165 Hanover, Germany

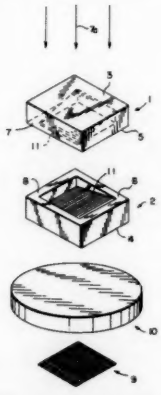
PCT No. PCT/DE95/01130, § 371 Date Feb. 18, 1997, § 102(e) Date Feb. 18, 1997, PCT Pub. No. WO96/06335, PCT Pub. Date Feb. 29, 1996

PCT Filed Aug. 24, 1995, Appl. No. 801,633

Claims priority, application Germany, Aug. 24, 1994, 44 31 412

Int. Cl.[7] **G01B** *9/02*

U.S. Cl. 356—346 **13 Claims**



1. An interferometric device for performing spectroscopic measurements based on interferometric principles, said device comprising

a plurality of interferometers, each of said interferometers consisting of two partially transparent parallel mirrors, and said interferometers being arranged in a rectangular array so that a distance between the two parallel mirrors of each of said interferometers is unique and so that a plurality of different phase relationships of reflection are present within the array for each wavelength of light (**7***a*) to be measured;

an array (**9**) of photodetectors positioned behind said rectangular array of the interferometers to produce output signals from the light (**7***a*) to be measured; and

means for transforming the output signals from the photodetector array to produce a spectrum;

wherein said distances between the two mirrors of the respective interferometers are uniformly distributed within a range from a smallest distance to a largest distance, the photodetector array (**9**) positioned behind the rectangular array of interferometers is arranged so that at least one of the photodetectors is positioned behind each of the interferometers in order to detect the light (**7***a*) to be measured falling perpendicularly onto each of the interferometers; and

wherein the plurality of interferometers comprises two parallel plates (**1**,**2**) having two flat surfaces (**3**, **4**) facing away from each other on different ones of the parallel plates and two facing surfaces (**5**,**6**) provided with a staircase-like series of steps (**11**) of a predetermined step height, the predetermined step height of each of the steps is identical on each of the plates, the predetermined step height of the steps on one of the plates (**1**,**2**) differs from the predetermined step height of the steps on the other of the plates (**1**,**2**), and the two plates (**1**,**2**) are mounted together so that the steps (**11**) on one plate (**1**,**2**) are oriented perpendicularly to the steps (**11**) on the other plate (**1**,**2**).

6,016,200

METHOD AND AN APPARATUS FOR DETECTING TOPPLED PACKAGES LYING ON A CONVEYOR

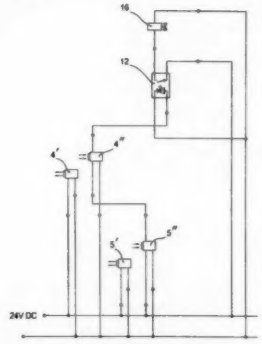
Uno Sjostrand, Flyinge, Sweden, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Jul. 17, 1998, Appl. No. 116,927

Claims priority, application Sweden, Jul. 28, 1997, 9702809

Int. Cl.[7] **B65G** *43/08*

U.S. Cl. 356—375 **11 Claims**



1. A method for detecting toppled packages, the packages lying on a conveyor that transports the packages past an apparatus, the apparatus comprising an upper pair of photocells and a lower pair of photocells, each pair of photocells comprising a light beam transmitter and a light beam receiver, the method comprising the steps of:

a) forming a connection between the lower pair of photocells and the upper pair of photocells;

b) transmitting a signal from the lower pair of photocells to the upper pair of photocells when the lower light beam is broken;

c) transmitting a signal from the upper pair of photocells to a valve actuating device when the upper light beam is broken;

d) actuating a removal device with the valve actuating device; and

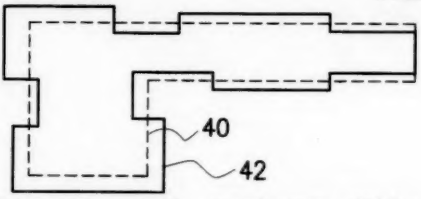
e) removing the fallen package from the conveyor with the removal device.

6,016,201

INSPECTION METHOD FOR A CORRECTION PATTERN

Chin-Lung Lin, Kaohsiung, and Yao-Ching Ku, Hsinchu Hsien, both of Taiwan, assignors to United Microelectronics Corp., Taipei, Taiwan

Filed Aug. 17, 1998, Appl. No. 135,435
Claims priority, application Taiwan, Jun. 11, 1998, 87109286
Int. Cl.[7] G01B *11/00*
U.S. Cl. 356—388 **6 Claims**



1. An inspection method for a correction pattern, which is used to inspect an optical correction pattern of an original pattern, wherein the optical correction pattern is obtained by optical correcting the original pattern, the inspection method comprising:

doing an "exclusive or" logic operation to the original pattern and the optical correction pattern to obtain an inspection pattern, wherein the inspection pattern comprises a plurality of line width sizing; and

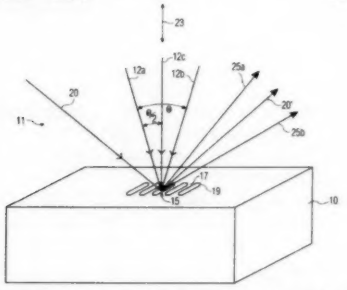
comparing the line width sizing of the inspection pattern with an optical correction reference size.

6,016,202

METHOD AND APPARATUS FOR MEASURING MATERIAL PROPERTIES USING TRANSIENT-GRATING SPECTROSCOPY

Martin Fuchs, Uxbridge, Mass.; John A. Rogers, Castle Rock, Colo., and Matthew J. Banet, Cambridge, Mass., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1997, Appl. No. 885,555
Int. Cl.[7] G01B *9/02*
U.S. Cl. 356—432 T **32 Claims**



1. An apparatus for measuring a property of a sample, comprising:

an excitation laser that generates an excitation laser beam;

a beam-delivery system, aligned along an optical axis, that separates the excitation laser beam into at least three sub-beams;

an imaging system aligned along the optical axis that collects the at least three sub-beams and focuses them onto the sample to form an optical interference pattern that generates a time-dependent response in the sample;

a probe laser that generates a probe laser beam oriented to diffract off the time-dependent response to form at lest one signal beam;

a detector that detects the at lest one signal beam and in response generates a radiation-induced electronic response; and

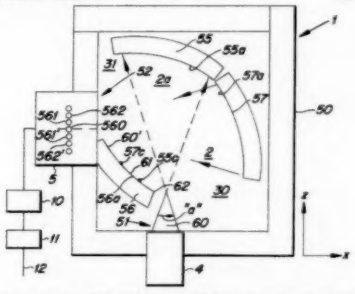
a processor that processes the radiation-induced electronic response to determine the property of the sample.

6,016,203

GAS SENSOR

Hans Göran Evald Martin, Östansjö 2837, 820 60 Delsbo, Sweden

PCT No. PCT/SE96/01448, § 371 Date Apr. 22, 1998, § 102(e) Date Apr. 22, 1998, PCT Pub. No. WO97/18460, PCT Pub. Date May 22, 1997
PCT Filed Nov. 11, 1996, Appl. No. 51,852
Claims priority, application Sweden, Nov. 13, 1995, 9504020
Int. Cl.[7] G01N *21/00*
U.S. Cl. 356—432 **18 Claims**



1. A gas sensor, designed to enable a measurement of a gas sample that is enclosed in a cavity (**2**), having the shape of a block; the wall or wall sections of the cavity exhibiting highly-reflective properties for light; said cavity containing means (**51**) for incoming rays of light (**60**), where said rays of light are arranged to pass reflected across said cavity (**2**), thereby forming an optical measuring path before the reflected beams of light are aimed towards means (**52**) for exiting rays of light, characterised in that said cavity (**2**) exhibits opposing surface sections (**2***a*, **2***b*) that are designed and coordinated so close together that incoming rays of light (**60**) are arranged to pass in a plane—without reflecting, or without appreciably reflecting—across said cavity (**2**) to a concave mirror surface (**55***a*, **56***a*, **57***a*) that is oriented in a right angle to the plane and that reflected beams of light are converging at said means (**52**) for exiting rays of light.

6,016,204

ACTUATOR PERFORMANCE INDICATOR

Roger W. Budnik, Rochester; James M. Pacer, Webster; Guru B. Raj, Fairport; Ralph A. Shoemaker, Rochester; Michael G. Swales, Sodus, and Michael E. Beard, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1998, Appl. No. 35,126
Int. Cl.[7] B41B *15/00*
U.S. Cl. 358—1.14 **30 Claims**

1. In an image processing machine having charge, exposure, and development subsystems and including a control and a sensor system to monitor developed test patches, a method of monitoring machine performance comprising the steps of:

developing multiple test patches with nominal settings for the charge, exposure, and development subsystems, each of the test patches having a nominal reflectance range,

measuring A reflectance level of each of the test patches,

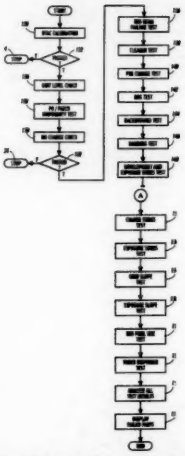
If the reflectance level of each of the patches is outside the nominal reflectance range, determining a charging malfunction,

If the reflectance level of each of the patches is within the nominal reflectance range, creating a first additional test patch by turning off the charge and exposure subsystems and enabling the development subsystem,

measuring A reflectance level of the first additional test patch,

depending upon the reflectance level of the first additional test patch, determining the status of the development subsystem,

creating a second additional test patch using nominal charge and nominal development settings and a relatively high exposure setting,



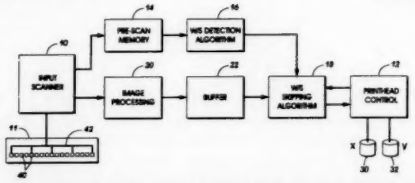
measuring A reflectance level of the second additional test patch, depending upon the reflectance level of the second additional test patch, determining A status of the exposure subsystem.

6,016,205

INK-JET COPIER IN WHICH AN ORIGINAL IMAGE IS PRESCANNED FOR OPTIMIZED PRINTING

Morton Silverberg, Westport, Conn., and George J. Roller, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 22, 1997, Appl. No. 916,499
Int. Cl.[7] B41B *15/00*
U.S. Cl. 358—1.6 **3 Claims**



1. A method of operating a digital copier having an input scanner for scanning an original image, the input scanner including a sensor array, an ink-jet printhead, and a printhead control for moving the printhead relative to a copy sheet and causing the printhead to deposit ink at a predetermined location on the copy sheet, comprising the steps of:

scanning the original image to yield low-resolution image data;

identifying, based on the low-resolution image data, areas of contiguous white space of a predetermined minimal size in the original image;

scanning the original image to yield high-resolution image data; and

printing a copy of the original image on the copy sheet with the printhead based on the high-resolution image data, the printing step including causing the printhead control to cause the printhead to skip a location on the copy sheet corresponding to an identified area of contiguous white space of a predetermined minimal size in the original image;

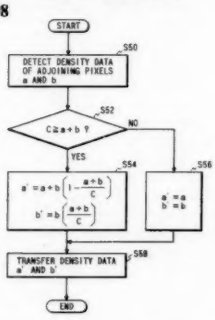
the step of scanning the original image to yield low-resolution image data including extending an integration time for individual photosensors in the array, compared to an integration time for the step of scanning the original image to yield high-resolution image data.

6,016,206

IMAGE PROCESSING METHOD AND APPARATUS AND IMAGE FORMING METHOD AND APPARATUS USING THE SAME

Jun Koide, Tokyo; Nobuatsu Sasanuma, Yokohama, and Yuichi Ikeda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1995, Appl. No. 575,141
Claims priority, application Japan, Dec. 20, 1994, 6-316704; Jul. 12, 1995, 7-175989; Dec. 15, 1995, 7-327334
Int. Cl.[7] H04N *1/38*
U.S. Cl. 358—298 **17 Claims**



1. An image processing apparatus comprising:

input means for inputting image data represented by multi-density level pixel data;

detecting means for detecting density levels of each pixel;

transposing means for transposing a density of a first pixel to a density of a second pixel neighboring the first pixel, wherein a transposition ratio corresponding to the first pixel changing adaptively according to the density levels of the first and second pixels detected by said detecting means; and

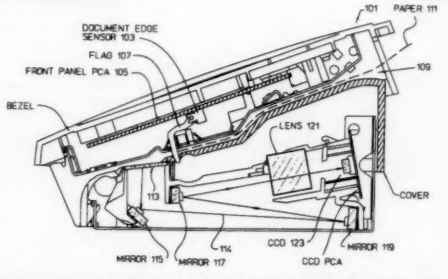
output means for outputting the image data processed by said transposing means.

6,016,207

FACSIMILE SCAN POSITION CALIBRATION APPARATUS AND METHOD

Paul Jeffrey Wield, Poway, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of application No. 08/413,573, Mar. 30, 1995, abandoned. This application Jul. 24, 1997, Appl. No. 899,804.
Int. Cl.[7] H04N *1/00*
U.S. Cl. 358—406 **20 Claims**



1. A method to calibrate a facsimile machine including a document feed path, a leading edge sensor and a scan mechanism, the method comprising the steps of:

feeding a calibration chart into the facsimile machine to be calibrated;

detecting a leading edge of the calibration chart;

advancing the calibration chart a preset amount along a document path after the leading edge has been detected;

after the calibration chart has been advanced by the preset amount, causing the facsimile machine to commence to scan the calibration chart and thereby produce a stream of output data;

sending the stream of output data to an associated computer;

causing the associated computer to determine where on the calibration chart relative to the leading edge the facsimile machine began scanning by monitoring the stream of output data;

causing the associated computer to send a correction offset value to the facsimile machine if the position where the facsimile machine began scanning the calibration chart was not at a predetermined position, the offset value determined by the association computer to adjust the preset amount to compensate for tolerance stacks-ups affecting the relative positions of the edge sensor and the scan mechanisms; and

causing the facsimile machine to use the correction offset value to adjust where on a document the facsimile machine begins scanning.

6,016,208

DATA PROVIDING METHOD

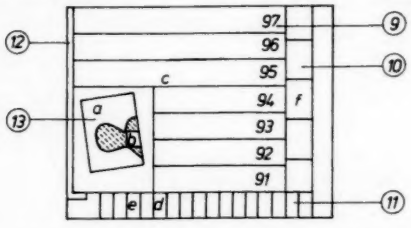
Paul Walter Vinck, Hove, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Apr. 22, 1991, Appl. No. 688,288

Claims priority, application Belgium, Apr. 26, 1990, 90201042

Int. Cl.[7] H04N *1/40*

U.S. Cl. 358—448 **10 Claims**



1. A method of identifying non-density data in a data processing system comprising determining a relation between non-density data and corresponding preset density values, storing said relation between non-density data and preset density values in a data processing system and feeding said density values into said data processing system to identify the corresponding non-density data.

6,016,209

IMAGE FORMING APPARATUS

Toshihisa Motosugi, Okazaki, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 13, 1997, Appl. No. 799,877

Claims priority, application Japan, Feb. 16, 1996, 8-029152

Int. Cl.[7] H04N *1/46;1/387*

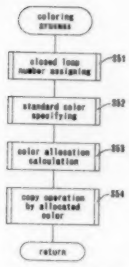
U.S. Cl. 358—537 **23 Claims**

1. An image forming apparatus capable of coloring a plurality of editing areas, said color image forming apparatus comprising:

a recording member for recording a plurality of color data corresponding to a hue circle;

determining member for determining a standard color; and

a selection device for selecting color data corresponding to each of said color editing areas based on the number of said color



editing areas, a number of said plurality of color data corresponding to the hue circle, and said set standard color.

6,016,210

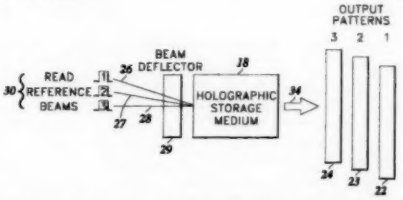
SCATTER NOISE REDUCTION IN HOLOGRAPHIC STORAGE SYSTEMS BY SPECKLE AVERAGING

Eddy Alfons Stappaerts, San Ramon, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Dec. 15, 1997, Appl. No. 990,313

Int. Cl.[7] G03H *1/22;* **G11C** *13/04*

U.S. Cl. 359—10 **24 Claims**



1. A method for mitigating scatter noise in output patterns of hologram while reading out a hologram from a holographic storage medium, the hologram being written by interfering a write reference beam and an object beam, the method comprising the steps of:

(a) illuminating the holographic storage medium with a first read reference beam propagating along a centerline of the write reference beam;

(b) producing a first hologram output pattern from the holographic storage medium, the first hologram output pattern including a first data signal pattern and a first noise pattern;

(c) recording the first hologram output pattern on a detector array having M rows of pixels, the recorded first hologram output pattern having a first signal-to-noise ratio;

(d) transferring electric charges of pixels in each originating row of the M rows of pixels to corresponding pixels in a subsequent row of the M rows of pixels, the distance between an originating row and a subsequent row being equal to the translation distance between the first data signal pattern and the succeeding data signal pattern;

(e) illuminating the holographic storage medium with a succeeding read reference beam, the succeeding read reference beam forming a separation angle with the first read reference beam;

(f) producing a succeeding hologram output pattern from the holographic storage medium, the succeeding hologram output pattern including a succeeding data signal pattern and a succeeding noise pattern, the succeeding data signal pattern substantially corresponding to the first data signal pattern shifted by a translation distance related to the separation angle, the succeeding noise pattern being uncorrelated to the first noise pattern; and

(g) recording the succeeding hologram output pattern on the detector array such that electric charges associated with the succeeding hologram output pattern are added to preexisting electric charges of pixels in the detector array, the recorded

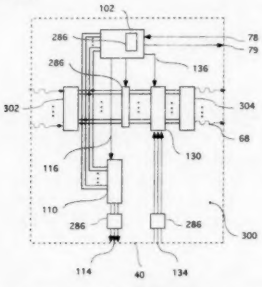
succeeding hologram output pattern having a signal-to-noise ratio substantially greater than the first signal-to-noise ratio.

6,016,211

OPTOELECTRONIC SMART PIXEL ARRAY FOR A RECONFIGURABLE INTELLIGENT OPTICAL INTERCONNECT

Ted Szymanski, 3600 Av. du Parc, #1011, Montreal, Canada, H2X 3R2, and Harvard Scott Hinton, 1606 Alpine, Longmont, Colo. 80501

Filed Jun. 19, 1995, Appl. No. 491,633
Int. Cl.[7] H04J *14/00;* **G06E** *1/04*
U.S. Cl. 359—117 **35 Claims**



1. A packaged opto-electronic data switching means comprising

a plurality of optical channel input means, each comprising an optical-to-electronic signal converter for conversion of optical signals received at said optical channel input means to corresponding electrical signals;

a plurality of optical channel output means, each comprising an electrical-to-optical signal converter for conversion of electrical signals received at said optical channel output means into corresponding optical signals;

an electrical injector channel input means;

an electrical extractor channel output means;

control input means for inputting control signals;

an extractor-selector data switching means operably connected to said optical channel input means and said electrical extractor channel output means, said extractor-selector data switching means to receive electrical signals from said optical channel input means and switch a subset of said received electrical signals to said electrical extractor channel output means responsive to control signals;

an injector-selector data switching means operably connected to said electrical injector channel input means, and said optical channel output means, for switching electrical signals from said optical channel input means and said electrical channel input means, to said optical channel output means in response to control signals;

a mechanical substrate comprising a plurality of electrical conductors, wherein said extractor-selector data switching means is interconnected to said optical channel input means and said electrical extractor channel output means by way of electrical conductors on said substrate, and said injector-selector data switching means is connected to said electrical injector channel input means, and said optical channel output means by way electrical conductors on said substrate;

and a packaging means suitable for mounting said opto-electronic data switching means onto a substantially larger processing module, said packaging means packaging said optical channel input means, said output channel output means, said control input means, said electrical injector-channel input means, said electrical extractor-channel output means, said injector-selector data switching means, said extractor-selector data switching means and said substrate,

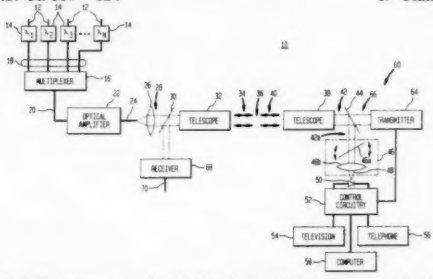
thereby providing a packaged opto-electronic data switching means which supports controllable switching of data received on incoming electronic injector channel at said electronic injector channel input means onto outgoing optical channels at said plurality of optical channel output means and controllable switching of data received on incoming optical channels at said plurality of optical channel input means onto outgoing electrical extractor channel at said electrical extractor channel output means.

6,016,212

OPTICAL RECEIVER AND DEMULTIPLEXER FOR FREE-SPACE WAVELENGTH DIVISION MULTIPLEXING COMMUNICATIONS SYSTEMS

Gregory M. Durant, Plainfield, and Christopher L. Rutledge, Somerset, both of N.J., assignors to AT&T Corp, New York, N.Y.

Filed Apr. 30, 1997, Appl. No. 848,370
Int. Cl.[7] H04J *14/02*
U.S. Cl. 359—124 **19 Claims**



1. A free-space wavelength division multiplexing system having a plurality of channels, each channel being associated with a light source of a different optical wavelength, the system having a first node at which the light sources of different optical wavelengths are multiplexed together into a multiplexed optical signal and a second node at which a user has electrical system components, the system comprising:

free-space transmitter optics at the first node for launching the multiplexed optical signal into free space as a multiplexed optical beam;

free-space receiver optics at the second node for receiving the multiplexed optical beam from free-space;

a rotatable optical interference filter that receives the multiplexed optical beam from the free-space receiver optics and transmits a demultiplexed optical beam that corresponds to a single selected one of the channels and that has a single selected wavelength;

a positioner for controlling the angular position of the interference filter with respect to the multiplexed optical beam to determine which channel is transmitted; and

a photodetector for receiving the demultiplexed optical beam and providing corresponding output signals for the selected channel.

6,016,213

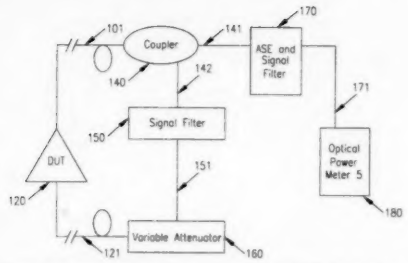
METHOD AND APPARATUS FOR OPTICAL AMPLIFIER GAIN AND NOISE FIGURE MEASUREMENT

Gennady Farber, Palo Alto, and Salim Jabr, Mountain View, both of Calif., assignors to Ditech Corporation, Mountain View, Calif.

Filed Jul. 8, 1996, Appl. No. 676,561
Int. Cl.[7] H04B *10/02*
U.S. Cl. 359—177 **13 Claims**

1. An apparatus for the measurement of optical amplifier noise figure and gain comprising:

means for coupling a known part of the output power of an amplifier under test to a wavelength filtering means and the remaining part of said output power to lasing power elimination means.



means for controlling the attenuation of light in a fiber to a known value,

means for measuring optical power by converting the optical power to an electrical signal, and

means for converting said electrical signal to a digital representation for further processing,

wherein the output of the amplifier under test is made to enter said coupling means and the first output of said coupling means is directed into the wavelength filtering means, the output of said wavelength filtering means is directed into said attenuation means, the output of said attenuation means is directed back into the input of said optical amplifier under test, and the second output of said coupling means is directed into said lasing power elimination means and the output of the lasing power elimination means is directed into said means for converting the optical power into an electrical signal.

6,016,214

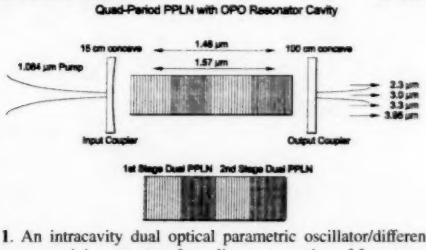
QUADRUPLE GRATING PERIOD PPLN OPTICAL PARAMETRIC OSCILLATOR DIFFERENCE FREQUENCY GENERATOR WITH COMMON DOUBLY RESONANT CAVITY

Ronald K. Meyer, Jr., Chicago; Mohan Vaidyanathan, Algonguin; William Pekny, Schaumberg; Gerald P. Griffith, Western Springs, all of Ill., and Peter H. Mui, Fairfax, Va., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Sep. 11, 1998, Appl. No. 151,539

Int. Cl.[7] **G02B** *26/00;* **G02F** *1/35*

U.S. Cl. 359—237 **16 Claims**



1. An intracavity dual optical parametric oscillator/difference-frequency mixing structure for colinear generation of four separate wavelengths and efficient pump to idler wave conversion comprising:

(a) an optical pump source for providing a pump beam at a primary wavelength;

(b) a singly resonant cavity having an input end and an output end;

(c) a monolithic nonlinear optical medium disposed in said cavity for sustaining optical parametric oscillation and difference-frequency mixing, said monolithic nonlinear optical medium comprising:

(i) a first region having a first grating period adapted to operate as an optical parametric oscillator;

(ii) a second region having a second grating period adapted to operate as a different frequency mixer wherein said first and second regions are adapted to produce a first signal frequency, a first idler frequency and a first-difference frequency;

(iii) a third region having a third grating period adapted to operate as an optical parametric oscillator; and

(iv) a fourth region having a fourth grating period adapted to operate as a difference-frequency mixer wherein said third and fourth regions are adapted to produce a second signal frequency, a second idler frequency and a second difference-frequency.

(d) an input mirror positioned at the input end of said cavity, adapted to couple the pump beam into the resonator cavity through the monolithic nonlinear optical medium and further adapted to be reflective of the first and second signal frequencies to resonate the signal frequencies within the cavity; and

(e) an output mirror positioned at the output end of said cavity, adapted to couple the first and second difference-frequencies and first and second idler frequencies external to the cavity, and further adapted to be reflective of the first and second signal frequency to resonate the signal frequencies within the cavity.

6,016,215

VARIABLE TRANSMITTANCE ELECTROCHROMIC DEVICES

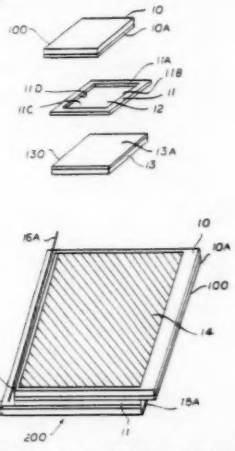
Harlan J. Byker, 107 Glendale Ave., Holland, Mich. 49423, assignor to Gentex Corporation, Zeeland, Mich.

Continuation of application No. 08/175,781, Dec. 30, 1993, Pat. No. 5,801,873, which is a continuation of application No. 07/874,175, Apr. 23, 1992, Pat. No. 5,751,467, which is a continuation of application No. 07/760,877, which is a division of application No. 07/422,601, which is a division of application No. 06/846,354, Mar. 31, 1986, Pat. No. 4,902,108. This application Aug. 26, 1998, Appl. No. 140,052.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G02F** *1/153*

U.S. Cl. 359—272 **9 Claims**

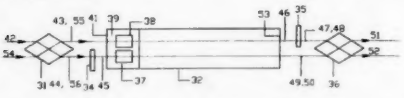


1. An electrochromic device, comprising a single compartment, self-erasing, solution-phase variable transmittance component that provides continuously variable transmittance over a range of transmittance as a function of the potential difference applied, and wherein the sheet resistance of a transparent electrode layer of the electrochromic device is less than 40 ohms per square.

6,016,216
POLARIZATION-INDEPENDENT ACOUSTO-OPTIC TUNABLE FILTER

I-Cheng Chang, Sunnyvale, Calif., assignor to Aurora Photonics, Inc., Santa Clara, Calif.

Filed May 17, 1997, Appl. No. 858,093
Int. Cl.[7] G02F *1/11;1/33*
U.S. Cl. 359—285 **9 Claims**



1. Apparatus for diffracting an incident light beam independent of the polarization of said incident light beam, comprising:

a) an input polarizing beamsplitter means to separate said incident light beam into two orthogonally polarized light beams traveling along two separate optical branches;

b) a first polarization converter means placed in one optical branch to cause the light beams in the separate optical branches to be the same polarization;

c) acousto-optical devices means for diffracting said light beams of the same polarizations into two diffracted light beams; and

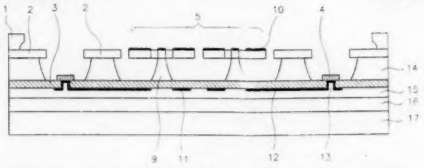
d) a second polarization converter means placed in one of said optical branches to cause the diffracted light beams to be orthogonal polarizations; and

e) an output polarizing beamsplitter means to recombine the two diffracted light beams of orthogonal polarization into a single diffracted light beam.

6,016,217
MICRO SWIVEL ACTUATORS AND A PROCEDURE FOR THE PRODUCTION OF THE SAME

Wolfram Dötzel; Thomas Gessner; Ramon Hahn, all of Chemnitz; Christian Kaufmann, Burgstädt; Heinz-Ulrich Löwe, Niederwiesa; Joachim Markert, Chemnitz; Manfred Rauch, Chemnitz, Kristina Rauch, Andreas Rauch, legal representatives, and Udo Wollmann, Chemnitz, all of Germany, assignors to CMS Mikrosystene GmbH Chemnitz, Chemnitz, Germany

PCT No. PCT/DE96/01177, § 371 Date Jul. 20, 1998, § 102(e) Date Jul. 20, 1998, PCT Pub. No. WO97/02506, PCT Pub. Date Jan. 23, 1997
PCT Filed Jun. 26, 1996, Appl. No. 983,119
Claims priority, application Germany, Jun. 30, 1995, 195 23 886; Dec. 20, 1995, 195 47 584
Int. Cl.[7] G02B *26/08*
U.S. Cl. 359—292 **18 Claims**



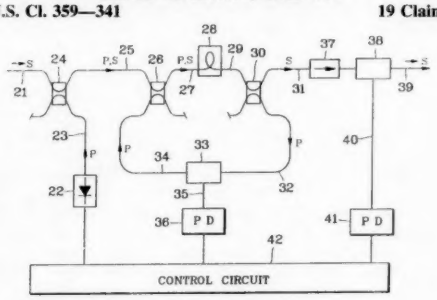
1. Micromechanical motion facility with the following characteristics:

a first semiconductor wafer (**2**), an oxide layer (**14**) on the first semiconductor wafer (**2**), where the first semiconductor wafer (**2**) is formed in such a way as to form arrays (**5**) of micromechanical, flexible, one-piece bandlike elements (**6**), which are arranged parallel to each other, one array (**5**) consists of at least one carrier and several elements (**6**), first bandlike electrodes are mounted on these elements (**6**) which simultaneously serve as reflection layer (**10**), these first bandlike electrodes are mounted on the oxide layer (**14**) on the opposing side of the first semiconductor wafer (**2**), and where at least one swivel bearing is integrated in the elements (**6**), a first electrical insulation layer (**3**) on the side of the oxide layer (**14**) across from the semiconductor wafer (**2**), where arranged on the first electrical insulation layer (**3**) corresponding to the edges of the elements (**6**) are at least one second electrode (**11**) as well as feeder lines (**12**) which serve as electrical connection between the second electrodes (**11**) and bondpads (**4**), the first electrical insulation layer (**3**) has windows (**13**, **20**) for the bondpads (**4**) and for adjustment marks (**22**), which are located on the edge of the first semiconductor wafer (**2**), and where the windows (**20**) for the adjustment marks (**22**) have a layer of the second electrodes (**11**) and feeder lines (**12**), several support elements (**9**) created by purposeful undercutting of the elements (**6**) from the oxide layer (**14**) on the swivel bearings between the elements (**6**) and the first insulation layer (**3**), a second insulation layer (**15**) on the first insulation layer (**3**) and a second semiconductor wafer (**17**) with an oxide layer (**16**), where the oxide layer (**16**) of the second semiconductor wafer (**17**) is connected to the second insulation layer (**15**).

6,016,218
OPTICAL FIBER AMPLIFIER

Sung Chil Jo, Kyungki-do, and Bong Su Choi, Incheon, both of Rep. of Korea, assignors to Daewoo Telecom Ltd., Icheon, Rep. of Korea

Filed Dec. 29, 1997, Appl. No. 999,324
Claims priority, application Rep. of Korea, Dec. 31, 1996, 96-78489; Dec. 31, 1996, 96-78527
Int. Cl.[7] H01S *3/094;* **G02B** *6/28*
U.S. Cl. 359—341 **19 Claims**



1. An optical fiber amplifier, comprising:

an optical line through which an optical signal is transmitted;

a rare-earth-doped fiber, doped with a predetermined rare earth ion, being set on the optical line;

a pumping light beam source for generating a pumping light beam having a predetermined wavelength;

a first multiplexer for coupling the pumping light beam to the optical line;

a second multiplexer for separating the pumping light beam outputted through the rare-earth-doped fiber from the optical signal; and

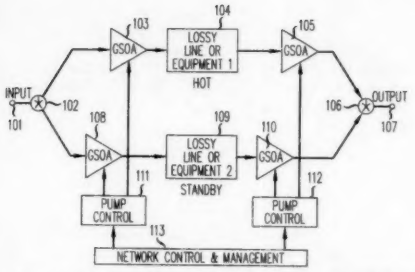
pumping light beam feedback means for looping a portion of the separated pumping light beam back to the same rare-earth-doped fiber.

6,016,219
OPTICAL PROTECTION SWITCHING SYSTEM

Mohammad T. Fatehi, Middletown, and Wayne Harvey Knox, Rumson, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of application No. 08/777,892, Dec. 31, 1996, Pat. No. 5,889,610. This application Oct. 7, 1998, Appl. No. 168,267.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] G02B *6/26;* **H01S** *3/00*
U.S. Cl. 359—341 **21 Claims**

1. An optical protection switching system having an input and an output comprising:



an input optical coupler for coupling an incoming optical signal to a plurality of optical communication arrangements, such that the input optical coupler performs a head-end bridging function for 1+N protection switching;

a plurality of gain-switched fiber optical amplifiers associated on a one-to-one basis with said plurality of said optical communication arrangements;

a pump arrangement for optically controlling ON/OFF states of each of the plurality gain-switched fiber optical amplifiers for controlling the routing of the incoming optical signal from the input to the output;

outputs from said gain-switched fiber optical amplifiers being supplied to the optical output through an output optical coupler,

the plurality of gain-switched fiber optical amplifiers, the output optical coupler, and the pump arrangement together forming a gain-switched optical selector for performing a tail-end switching function for 1+N protection switching.

6,016,220

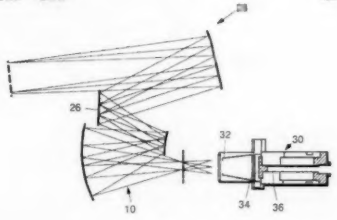
OFF-AXIS THREE-MIRROR ANASTIGMAT HAVING CORRECTOR MIRROR

Lacy G. Cook, El Segundo, Calif., assignor to Raytheon Company, Lexington, Mass.

Division of application No. 08/551,361, Nov. 1, 1995, Pat. No. 5,550,672. This application Apr. 9, 1996, Appl. No. 629,714.

Int. Cl.[7] **G02B** *5/10;13/14;17/06*

U.S. Cl. 359—351 **19 Claims**



1. An infrared imaging system comprising:

an on-axis dewar having an infrared detector; and

an off-axis anastigmat for focusing infrared radiation on the detector, the anastigmat having a primary mirror, a corrector mirror, a secondary mirror and a tertiary mirror in serial arrangement along an optical path, the primary mirror forming an intermediate image that is relayed by the secondary mirror and the tertiary mirror.

6,016,221

IMAGE-SHAKE PREVENTING DEVICE

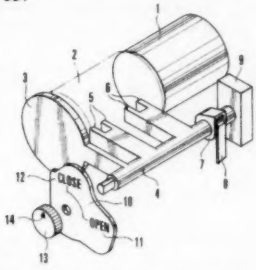
Naoya Kaneda, and Hironori Takano, both of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/122,661, Sep. 17, 1993, abandoned. This application Jun. 5, 1997, Appl. No. 870,021.

Claims priority, application Japan, Sep. 21, 1992, 4-274848; Oct. 16, 1992, 4-278721

Int. Cl.[7] **G02B** *27/64;* **G03B** *7/08*

U.S. Cl. 359—557 **16 Claims**



1. An apparatus adapted to an image-shake prevention apparatus for use with a camera settable in an image recording mode and a reproducing mode and having a closable barrier which covers an optical system, the image shake prevention apparatus including a movable member disposable along an optical axis and preventing image-shake by movement of the movable member in a direction different from the optical axis and having a restriction device which restricts movement of the movable member, the apparatus comprising:

a control device which causes the restriction device to perform a restriction operation and causes the closable barrier to close when the camera is set in the reproducing mode.

6,016,222

COLOR IMAGE READING APPARATUS

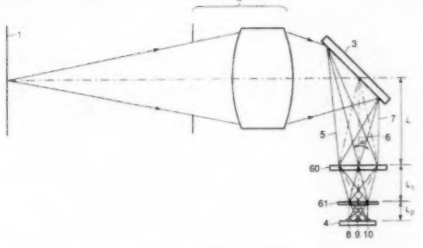
Michitaka Setani, Kawasaki, and Emiko Ueno, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1997, Appl. No. 971,104

Claims priority, application Japan, Nov. 20, 1996, 8-324590

Int. Cl.[7] **G02B** *5/18*

U.S. Cl. 359—571 **9 Claims**



1. A color image reading apparatus comprising:

light receiving means having a plurality of line sensors disposed on a surface of a common substrate;

an imaging optical system for forming an image or an object;

a blazed diffraction grating, disposed in an optical path between said imaging optical system and said light receiving means, for color-separating a beam from said object into a plurality of color beams;

a first optical element provided near a position where said plurality of color beams are focused in a sub scanning cross section by said imaging optical system; and

a second optical element provided in an optical path between said first optical element and said light receiving means.

wherein said plurality of color beams are focused on said first optical element and focused again on said light receiving means through said second optical element.

6,016,223

DOUBLE BESSEL BEAM PRODUCING METHOD AND APPARATUS

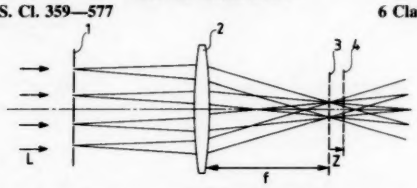
Masayuki Suzuki, Hadano, and Shigeyuki Suda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/111,867, Aug. 26, 1993, abandoned. This application Nov. 25, 1996, Appl. No. 755,357.

Claims priority, application Japan, Aug. 31, 1992, 4-255471

Int. Cl.[7] G02B *27/00*

U.S. Cl. 359—577 **6 Claims**



3. An apparatus for producing a double Bessel beam, comprising:

means for producing two beams each having an amplitude distribution in the shape of a zero-order Bessel function of the first kind and a beam diameter different from the other; and

means for superimposing the two beams on each other with respect to amplitude so as to interfere with each other and to produce a double Bessel beam wherein the amplitudes of side lobes are smaller than the amplitudes of side lobes of either of the two beams, wherein

a ratio ϵ of the diameters of the two beams is determined to satisfy the relation of $0.3 \leqq \epsilon \leqq 0.7$.

6,016,224

MULTIPLE IMAGE OPTICS SYSTEM

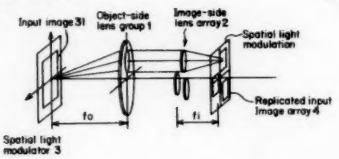
Mitsuru Namiki, Hanno, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

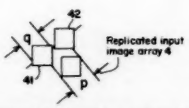
Filed Dec. 18, 1996, Appl. No. 768,926

Claims priority, application Japan, Dec. 18, 1995, 7-329043; Jan. 22, 1996, 8-008536

Int. Cl.[7] G02B *27/10*

U.S. Cl. 359—619 **6 Claims**





1. An optical apparatus for forming a plurality of images of an object, comprising:

an object-side lens group on an object side thereof which collimates a bundle of light from the object; and

an image-side lens array on an image side thereof which forms a plurality of images of the object from said collimated bundle of light, and satisfying the following condition (1):

$$0.8 \leqq q/p \leqq 1.0 \quad (1)$$

where p represents an intercentral distance between any replicated input image within an array of input images replicated on a back focal plane of the image-side lens array and a replicated input image nearest thereto, and q is a length of a segment of a line passing through centers of both said replicated input images which is cut off by one replicated input image.

6,016,225

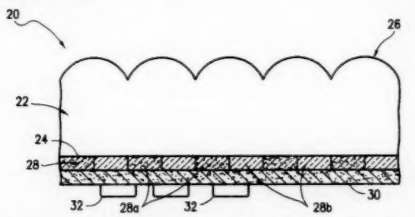
DATA CARD WITH LENTICULAR OPTICAL DISPLAY

Michael R. Anderson, Boca Raton, Fla., assignor to Vision International Production, Inc., Boca Raton, Fla.

Filed Nov. 7, 1997, Appl. No. 966,105

Int. Cl.[7] G02B *27/10*

U.S. Cl. 359—619 **3 Claims**



1. A data card, having first and second sides, wherein a first side includes data card information stored on a magnetic strip and embodied in embossed alpha-numeric indicia, and wherein a second side includes a surface having a series of optically related image lines thereon, and an optically transparent layer attached thereto, said optically transparent layer forming a lenticular lens, said optically transparent layer and said optically related image lines forming a lenticular optical system capable of alternately displaying images.

6,016,226

OBJECTIVE LENS FOR A MICROSCOPE

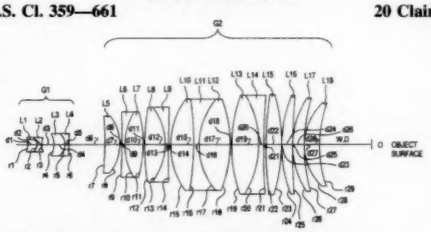
Katsuyoshi Arisawa, Kawasaki, Japan, assignor to Mitutoyo Corporation, Kawasaki, Japan

Filed Mar. 6, 1998, Appl. No. 35,764

Claims priority, application Japan, Mar. 12, 1997, 9-057539

Int. Cl.[7] G02B *21/02*

U.S. Cl. 359—661 **20 Claims**



1. An objective lens for a microscope comprising:

a first lens group positioned far from a surface of an object and having a negative refractive power;

a second lens group disposed between the object and said first lens group and having a positive refractive power;

said first lens group including a compound lens comprising a cemented doublet with a lens having a convex surface facing the object side and a lens having a concave surface facing the image side; and

said second lens group including a single lens having a convex surface facing the object side, a compound lens comprising a cemented doublet with a lens having a convex surface facing the object side and a lens having a concave surface facing the image side, a first compound lens comprising a cemented

triplet, and three meniscus lenses proximate to the object with a concave surface of the meniscus lens of said three meniscus lenses closest to the object facing the object;

wherein said objective lens satisfies the following conditions:

$5F<D<15F$;

$F<|F1|<2.5F$;

$25<v2p-v2n<60$;

$0.01F<1/r<0.06F$;

and

$1.6<n$;

where D is a distance between said first lens group and said second lens group, F is a focal length of said objective lens, F1 is a focal length of said first lens group, v2p is an average Abbe number of all convex lenses of said second lens group, v2n is an average Abbe number of all concave lenses of said second lens group, r is a radius of curvature of said concave surface of said meniscus lens, and n is a refractive index of an object side end of said objective lens at d-line.

6,016,227

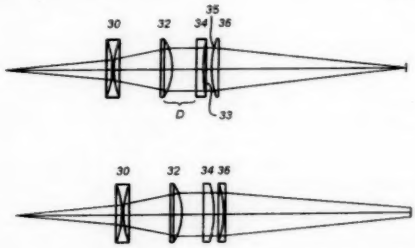
APPARATUS AND METHOD FOR PRODUCING AN IMPROVED LASER BEAM

John A. Hopkins, Tullahoma; Frederick A. Schwartz, Woodbury; Mary Helen McCay; Thurman Dwayne McCay, both of Monteagle; Narendra B. Dahotre, Tullahoma, and John Brice Bible, South Pittsburg, all of Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Jul. 31, 1998, Appl. No. 127,396

Int. Cl.[7] **G02B** *13/08;3/02;* **B23K** *26/00*

U.S. Cl. 359—668 **15 Claims**



10. An apparatus for shaping a laser beam emitted from a laser beam source to have a peak outer to average central intensity ratio greater than or equal to 1.2 comprising:

a. a collimating optical element positioned to collimate a laser beam emitted from a fiber optic source;

b. a first cylindrical optical element having a first curved outer surface, said first cylindrical optical element being positioned to receive a collimated laser beam from said collimating optical element, wherein said first cylindrical optical element is spaced 0.1 to 5,000.0 millimeters from said collimating optical element;

c. a second cylindrical optical element having a second curved outer surface that is oriented 89.5–90.5 degrees out of rotational alignment with said first curved surface, said second cylindrical optical element being located 5 millimeters from said first cylindrical optical element; and

d. a biconcave lens positioned between a laser beam source and said collimating optical element so as to project a more divergent laser beam on said collimating optical element.

6,016,228

ZOOM LENS SYSTEM

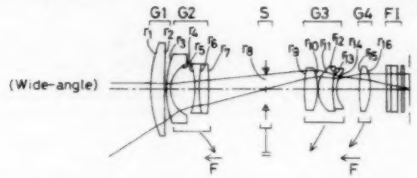
Tsutomu Uzawa, Hidaka, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Apr. 2, 1997, Appl. No. 825,735

Claims priority, application Japan, Aug. 23, 1996, 8-222197

Int. Cl.[7] **G02B** *15/14*

U.S. Cl. 359—687 **27 Claims**



1. A zoom lens system comprising, in order from an object side:

a first lens group having a positive refracting power;

a second lens group having a negative refracting power;

a third lens group having a positive refracting power; and

a fourth lens group having a positive refracting power,

said second lens group moving toward an image side thereof while said third and fourth lens groups move constantly toward said object side for zooming from a wide-angle end thereof to a telephoto end thereof,

said first lens group consisting only of a positive single lens,

said second lens group including at least one positive lens, and

said third lens group including at least one negative lens.

6,016,229

WIDE-ANGLE LENS

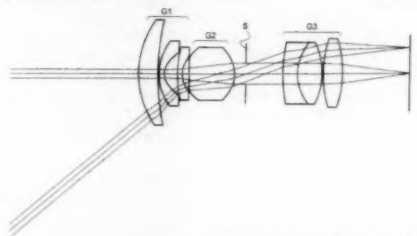
Kenzaburo Suzuki, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jul. 13, 1998, Appl. No. 114,327

Claims priority, application Japan, Aug. 5, 1997, 9-222072

Int. Cl.[7] **G02B** *9/12;9/00*

U.S. Cl. 359—784 **20 Claims**



1. A wide-angle lens system having an object side and an image side, comprising in this order from the object side:

a first lens group **G1** having a negative refractive power, the first lens group **G1** including a positive meniscus lens and at least one negative meniscus lens in this order from the object side;

a second lens group **G2** having a positive refractive power;

a diaphragm; and

a third lens group **G3** having a positive refractive power, the third lens group **G3** including a cemented lens having a convex surface facing the object side, said convex surface being positioned closest to the object in this lens group, the wide-angle lens system satisfying the conditions

$0.5<|f1|/f<1.05$

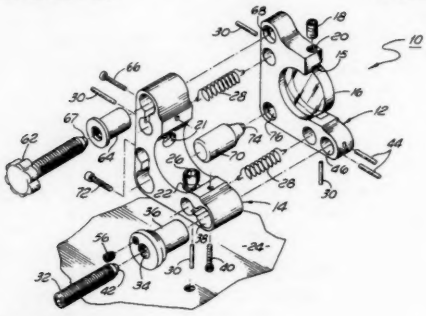
$1.7<bf/f<4.0$

where **f1** is a focal length of the first lens group **G1**, f is a focal length of the wide-angle lens, and bf is back focus.

6,016,230
OPTICAL MOUNT WITH A LOCKING ADJUSTMENT SCREW

M. A. Nunnally, Mission Viejo, and Paul F. Secrist, Laguna Niguel, both of Calif., assignors to Newport Corporation, Irvine, Calif.

Filed Mar. 11, 1998, Appl. No. 38,469
Int. Cl.[7] G02B *7/02*
U.S. Cl. 359—819 **22 Claims**

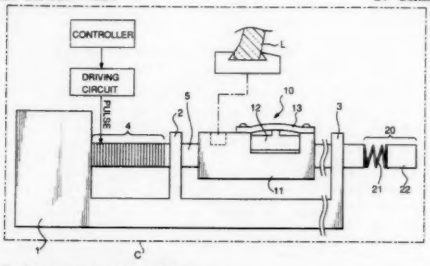


1. An optical mount, comprising:
a first plate;
a second plate;
a collet that is attached to said second plate, said collet having a slit that separates a collet flange from a collet base, said collet having a threaded portion;
a first drive screw that has a longitudinal axis, a threaded portion and extends through said collet and engages said first plate; and,
a locking fastener that pushes said collet flange away from said collet base to press at least a portion of said threaded portion of said collet into said threaded portion of said first drive screw along the longitudinal axis of said first drive screw.

6,016,231
DRIVE MECHANISM EMPLOYING ELECTROMECHANICAL TRANSDUCER AND APPARATUS EMPLOYING THE MECHANISM

Tetsuro Kanbara, Sakai, and Masayuki Ueyama, Takarazuka, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jul. 23, 1998, Appl. No. 121,755
Claims priority, application Japan, Jul. 24, 1997, 9-198299; Jul. 3, 1998, 10-188769
Int. Cl.[7] G02B *7/02*
U.S. Cl. 359—824 **17 Claims**



9. An apparatus comprising:
an electromechanical transducer that expands and contracts in response to an electric pulse being supplied thereto;
an electric circuit that supplies the electric pulse to the electromechanical transducer;
a drive member having a first end and a second end, the first end being connected to the electromechanical transducer;
a moving member that is frictionally connected to the drive member; and
a driven member that is connected to the moving member so that the driven member is driven by the moving member;
a resonant induction part that is connected to second end of the drive member.

6,016,232
HEAT CONDUCTING LASER RESISTANT STRUCTURES

Kenneth G. Leib, Wantagh, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

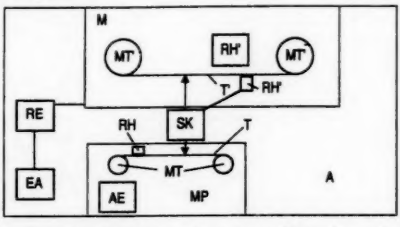
Filed Nov. 22, 1974, Appl. No. 526,603
Int. Cl.[7] G02F *1/36;* **G02B** *5/30*
U.S. Cl. 359—886 **21 Claims**

10. A multi-layer laser resistant structure consisting of:
an outer layer;
an inner layer;
means for maintaining said inner and outer layers a generally fixed distance apart;
means for substantially hermetically sealing the space between said inner and outer layers;
a generally heat conductive liquid contained in the space between said inner and outer layers;
a reservoir of said liquid coupled to the space between said inner and outer layers by hydraulic tubing;
a heat exchanger coupled to the space between said inner and outer layers;
circulating pump means coupled to the space between said inner and outer layers; and,
conduit means coupling said reservoir, said heat exchanger and said pump means to said space for providing a closed circulating coolant system with said space,
such that heat generated in said outer layer due to the incidence of laser radiation is conducted away from said outer layer by the liquid circulating in said space to said heat exchanger for substantially mitigating damage to said outer layer caused by the incidence of generally high intensity laser radiation.

6,016,233
MAGNETIC TAPE APPARATUS WITH HOUSING IN WHICH PLAYBACK ELECTRONICS AND MAGNETIC TAPE IS PERMANENTLY DISPOSED

Werner Scholz, Gehrden; Werner Bachnick, Hannover; Wulf-Christian Streckenbach; Bernd Wessolly, both of Hemmingen; Walter Voessing, Hannover; Hartmut Peters, Barsinghausen; Ernst F. Schroeder, Hannover; Friedrich Timmermann, Garbsen, all of Germany; Paul-Louis Meunier, Paris, and Max Artigalas, Le Chesnay, both of France, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

Filed Aug. 2, 1996, Appl. No. 691,991
Int. Cl.[7] G11B *5/86*
U.S. Cl. 360—15 **7 Claims**



1. A magnetic tape apparatus for the recording and reproduction of signals, comprising:

a magnetic tape having plural data tracks running parallel to an edge of the tape;

a multi-track reading device including a multi-track playback head configured to read simultaneously plural of said tracks and output signals corresponding to data recorded on said plural tracks; and

a housing in which said tape and said reading device are permanently disposed;

wherein said tape is adapted for simultaneous recording of data onto plural data tracks of said tape by means of external recording heads that record information in said plural data tracks when said apparatus is connected to an external recording facility containing the external heads.

6,016,234

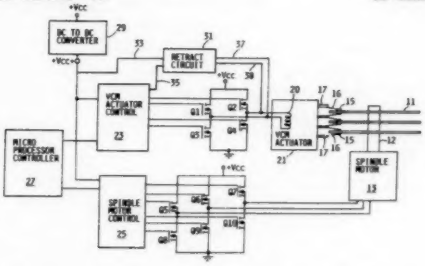
ACTUATOR RETRACT/UNLOAD SYSTEM FOR LOW POWER DISK DRIVES

Timothy J. Blank, Byron; Zine-Eddine Boutaghou, Rochester; Kevin Jack Erickson, Rochester, and Richard Greenberg, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 08/551,024, Oct. 31, 1995, abandoned, which is a continuation of application No. 08/174,950, Dec. 28, 1993, abandoned. This application Jul. 25, 1997, Appl. No. 900,961.

Int. Cl.[7] G11B *21/12;5/54*

U.S. Cl. 360—75 **15 Claims**



1. A method of retracting the head positioning actuator assembly of a disk drive device upon interruption of power to the device comprising the steps of

charging a first capacitor during normal operation with a voltage in excess of the supply voltage applied to the device to develop a stored charge on the first capacitor;

charging a second capacitor;

discharging the second capacitor, upon interruption of power to the device;

discharging the first capacitor, upon discharging the second capacitor;

passing the stored charge from the first capacitor directly to the actuator assembly, upon discharging the first capacitor; and

driving the actuator assembly to a predetermined retracted position.

6,016,235

TAPE RECORDER AND PLAY-BACK DEVICE HAVING UPPER AND LOWER RING GEARS

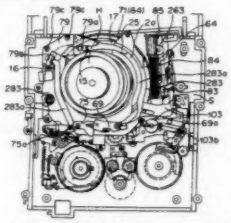
Kunio Sawai; Koji Morinaka, and Masaaki Mitsuhashi, all of Daito, Japan, assignors to Funai Electric Company Co., Ltd., Osaka, Japan

Filed Jan. 17, 1995, Appl. No. 372,977

Claims priority, application Japan, Jan. 17, 1994, 6-000580 U; Jan. 17, 1994, 6-000582 U; Jan. 17, 1994, 6-000583 U; Jan. 17, 1994, 6-000584 U; Jan. 17, 1994, 6-000585 U; Jan. 17, 1994, 6-000586 U; Jan. 17, 1994, 6-000587 U; Jan. 17, 1994, 6-000588 U; Jan. 17, 1994, 6-000589 U; Jan. 31, 1994, 6-001170 U

Int. Cl.[7] G11B *15/665*

U.S. Cl. 360—85 **3 Claims**



1. A magnetic tape recorder and/or play back device comprising:

a frame;

a chassis supported by said frame;

a rotary head cylinder mounted in said chassis;

a lower ring gear and an upper ring gear coaxially provided on said chassis;

a motor mounted on said chassis and driving to rotate said lower ring gear and said upper ring gear;

a first tape guide fixed to said lower ring gear;

a second tape guide fixed to said upper ring gear; and

first and second guide receiving portions provided in association with said lower ring gear and said upper ring gear and receiving said first tape guide and said second tape guide respectively, whereby rotation of said lower ring gear and said upper ring gear facilitate loading of the tape onto the rotary head cylinder;

a worm gear with which said lower ring gear is engaged, and a first slidable plate supporting said worm gear and slidable in a predetermined direction; a second slidable plate slidable in said predetermined direction; a further gear provided on said second slidable plate and engageable to said lower ring gear; and a spring bridged between said first slidable plate and said second slidable plate; wherein

when rotation of said lower ring gear and said upper ring gear are stopped, said first slidable plate is slid to said predetermined direction according to a rotation of said worm gear to slide said second slidable plate in said predetermined direction, whereby said further gear is adapted to further rotate said lower ring gear.

6,016,236

APPARATUS FOR THE STORAGE AND/OR REPRODUCTION OF INFORMATION ON/FROM AN INFORMATION CARRIER

Norbert C. Vollmann, Eindhoven, Netherlands, assignor to OnStream, Inc., Loveland, Colo.

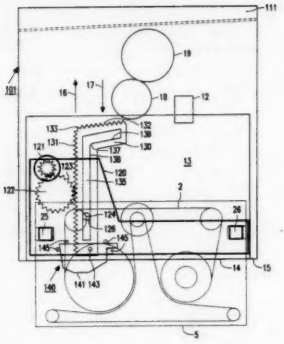
Filed Jul. 16, 1997, Appl. No. 895,254

Claims priority, application European Pat. Off., Oct. 21, 1996, 96202935

Int. Cl.[7] G11B *15/675*

U.S. Cl. 360—96.5 **20 Claims**

1. An apparatus for the storage and/or reproduction in information on/from an information carrier accommodated in a cartridge, which apparatus comprises:



a chassis,

a drive member for diving the information carrier via a drivable member of the cartridge,

a cartridge space for receiving a cartridge, which cartridge space is accessible via an opening in a wall of the apparatus,

a movable gripper arraigned in the cartridge space and adapted to grip the cartridge, and

a loading mechanism comprising an electric motor and a wheel drivable by the motor, which wheel has a first contact surface which cooperates with a second contact surface,

said second contact surface forming part of an element rotatable mounted in said chassis, said gripper having a pin for positioning said element for cooperation of said first and second contact surface, said element for moving the gripper linearly in an inward direction from a loading position, in which the cartridge can be inserted, into an operational position, in which the cartridge can be inserted, into an operation position, in which the information carrier can cooperate with the drive member, and for moving the gripper in an outward direction form the operational position to the loading position,

the second contact surface includes a first part and a second part angled with respect to said first part said second part extending at a first angle between 45 and 90 degrees relative to the inward direction;

whereby said motor moves said gripper for at least two different speeds and two different torque ratios.

6,016,237

SHAFT CONSTRUCTION OF A DISK DRIVE

Yoshifumi Mizoshita; Tomoyoshi Yamada; Yasumasa Kuroba; Toru Kouhei; Takao Sugawara; Masaru Matsumoto; Hiroyuki Mase; Masao Tsunekewa; Shinji Koganezawa, and Keiji Aruga, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of application No. 08/406,807, Mar. 20, 1995, Pat. No. 5,880,904, which is a continuation of application No. 07/946,359, Oct. 29, 1992, abandoned. This application Aug. 25, 1998, Appl. No. 139,765.

Claims priority, application Japan, Nov. 22, 1991, 3-307976; Jan. 7, 1992, 4-747; Jan. 7, 1992, 4-840; Jan. 16, 1992, 4-5433; Mar. 12, 1992, 4-53177; Mar. 18, 1992, 4-61704; Mar. 19, 1992, 4-63640; May 8, 1992, 4-115771; Jun. 30, 1992, 4-171372; Aug. 7, 1992, 4-211149

Int. Cl.[7] G11S *33/02;5/54*

U.S. Cl. 360—97.01 **20 Claims**

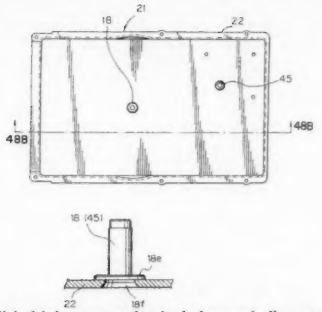
12. A disk drive for insertion into a slot formed in an external apparatus, said slot having a size for receiving an IC memory card therein, said disk comprising:

a housing including a cover and a base which are made of iron and formed by a press forming process; and

at least one connector fixed outside said housing;

wherein an inside of said housing includes

a) a disk that stores information;



b) a disk driving means that includes a spindle motor to force said disk to rotate, said spindle motor having a pair of first bearing means that support said disk rotatably, and a first fixed shaft that fixes said first bearing means in a predetermined position inside said housing, and said first fixed shaft being constructed to be fitted into said base and fastened by at least means of rivetting;

c) a head assembly that performs read/write operations on said disk; and

d) electronic circuitry that includes at least one interface circuit,

wherein said at least one connector is connected to said electronic circuitry, and wherein a whole outer dimension including said housing and said at least one connector is compatible in size with the IC memory card specified by a specification of PCMCIA-ATA.

6,016,238

SPINDLE MOTOR FOR DRIVING DISK

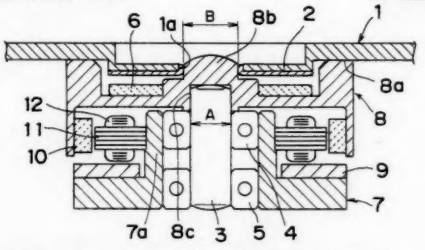
Shouichi Yoshikawa; Shinya Yukino, both of Yonago, and Masahiro Naba, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Sep. 20, 1995, Appl. No. 531,074

Claims priority, application Japan, Sep. 21, 1994, 6-226627

Int. Cl.[7] G11B *17/02*

U.S. Cl. 360—99.08 **13 Claims**



1. A magneto-optic disc-driving spindle motor comprising:

a rotary shaft;

bearings supporting said rotary shaft for free rotation; and

a spindle hub having said rotary shaft fixed thereto, said spindle hub comprising a magneto-optic disc loading face for receiving a magneto-optic disc thereon and an axial part that is to be fitted into a center hole of a magneto-optic disc;

wherein said rotary shaft has an outer diameter at a position where said bearings support said rotary shaft that is smaller than an outer diameter of said axial part of said spindle hub;

wherein said axial part of said spindle hub is imperforate.

6,016,239

TRANSDUCER APPARATUS INCLUDING TRANSDUCER WITH RECORDING MEDIUM CONTACT LINE PERPENDICULAR TO TRANSDUCER PIVOT AXIS

Osamu Mizuno, Osaka; Hisayuki Enshu, Kyoto, and Tohru Nakamura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

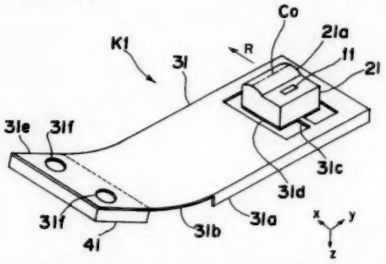
PCT No. PCT/JP96/02895, § 371 Date Jul. 2, 1998, § 102(e) Date Jul. 2, 1998, PCT Pub. No. WO97/14140, PCT Pub. Date Apr. 17, 1997

PCT Filed Oct. 4, 1996, Appl. No. 51,220

Claims priority, application Japan, Oct. 9, 1995, 7-261272

Int. Cl.[7] G11B *5/48*

U.S. Cl. 360—104 **31 Claims**



1. A transducer apparatus for use with a recording medium set at a recording medium location, comprising:

a transducer for recording and reproducing information on a recording medium set at the recording medium location;

a slider coupled with said transducer and including a projecting member for protruding towards a recording medium set at the recording medium location, said projecting member defining a substantially rectilinearly extending contact region at which said slider is adapted to contact a recording medium, set at the recording medium location, along a contact line defined by a segment extending through a substantially longitudinal central axis of said contact region and bounded by opposite ends of said contact region;

wherein said transducer is outside of said contact region;

a pivot means for pivotally supporting said slider so as to pivot about a pivot axis substantially perpendicular to said contact line; and

a loading means for depressing said projecting member against a recording medium set at said recording medium location.

6,016,240

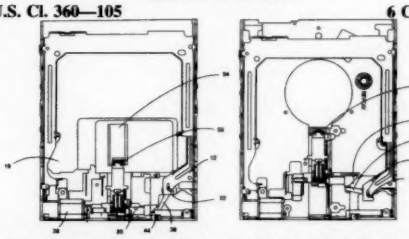
DISK HEAD POSITIONING SYSTEM INCLUDING LIFT WING EXTENSIONS ON THE ACTUATOR AND A PIVOTING LATCH

Jonathan David Jargon; Paul Andrew Wenker; Kenneth Hudson Fernalld, all of Boulder; James Harold Bodmer, Longmont, and David William Paquet, Louisville, all of Colo., assignors to O.R. Technology, Inc., Boulder, Colo.

Filed Apr. 8, 1998, Appl. No. 57,294

Int. Cl.[7] G11B *5/54*

U.S. Cl. 360—105 **6 Claims**



4. An improved removable-media disk drive having a chassis, a load/unload assembly mounted to the chassis that includes an eject frame and a receiver to clamp a diskette against the chassis, and an actuator assembly also mounted to the chassis that includes a pair of opposing transducers for accessing a data storage media of the diskette, the improvement comprising:

a pair of lift-wing extensions on the actuator assembly that engage the eject frame and provide for loading and unloading of the transducers during any insertion and ejection of the diskette; and

a pivoting latch mechanically disposed between the actuator and eject frame such that any forcing of the eject frame to slide back on the chassis will be mechanically translated to cause the actuator to fully retract and lock into a parked position and that then causes the pair of lift-wing extensions to be risen by the receiver and unload the transducers;

wherein said transducers are protected from mechanical injury if the diskette is manually ejected.

6,016,241

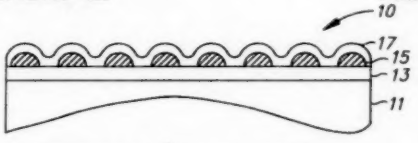
MAGNETORESISTIVE SENSOR UTILIZING A GRANULAR MAGNETORESISTIVE LAYER

Kevin Robert Coffey, San Jose; James Kent Howard, Morgan Hill; Todd Lanier Hylton, San Jose, and Michael Andrew Parker, Fremont, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/079,656, Jun. 18, 1993, abandoned. This application May 22, 1995, Appl. No. 445,479.

Int. Cl.[7] G11B *5/39*

U.S. Cl. 360—113 **4 Claims**



1. A magnetoresistive (MR) sensor, comprising:

an MR sensing element for reading information recorded in a magnetic medium, said MR sensing element having an MR effect, said MR sensing element including:

a layer of particles of ferromagnetic material embedded in a layer of nonmagnetic, electrically conductive material, the MR effect of said MR sensing element being the function of spin-dependent scattering of conduction electrons within said MR sensing element;

a bias layer of a magnetic material for providing a magnetic bias field for said MR sensing element; and

a spacer layer of a nonmagnetic material disposed between said bias layer and said magnetoresistive sensing element.

6,016,242

NARROW TOP POLES FOR INDUCTIVE MAGNETIC HEADS, MASKS AND PROCESSES FOR MAKING THE SAME

Steven A. Mastain, Chanhassen; Wallace A. Peck, Eagan; Diana M. Simplair, Savage, and Kurt A. Rothstein, Bloomington, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Provisional application No. 60/078,882, Mar. 20, 1998. This application Aug. 13, 1998, Appl. No. 134,779.

Int. Cl.[7] G11B *5/187;5/23*

U.S. Cl. 360—119 **6 Claims**

1. A wafer containing a plurality of inductive magnetic heads each having a bottom pole piece and a top pole piece defining a gap at an air bearing surface, the top pole piece defining a gap

width such that an average of the gap widths of the plurality of magnetic heads is not greater than 1.0 microns with a standard deviation of the average gap widths of the plurality of heads on the wafer being no more than 0.07, formed by:

patterning a mask in a layer of photolithographic material on a layer of insulating material on the wafer, the mask pattern defining a plurality of paddle regions, feeder regions, and trench regions between respective feeder regions and paddle regions, the paddle regions being over a respective hill region of respective ones of the magnetic heads, the feeder regions being over a waste region of the wafer, and the trench regions extending over respective gap regions of respective ones of the magnetic heads;

forming the mask by flowing solvent in a laminar flow through the trench regions from the respective feeder regions to the respective paddle regions to expose a surface of the layer of insulating material in the paddle and trench regions of the mask, the trench region having an average width no greater than 1.0 microns; and

placing a magnetic material on the layer of insulating material in the mask in the paddle and trench regions to form the top pole pieces of the plurality of heads.

6,016,243

MAGNETIC HEAD HAVING RECORDING MEDIUM FACING SURFACES WITH TILTED CRYSTAL ORIENTATION OF SINGLE CRYSTAL FERRITE

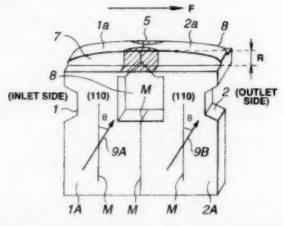
Yukari Nihei; Toru Matsunaga, and Takashi Tamura, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 18, 1997, Appl. No. 896,438

Claims priority, application Japan, Jul. 18, 1996, 8-189457

Int. Cl.[7] G11B *5/127*

U.S. Cl. 360—127 **7 Claims**



1. A magnetic head having a pair of magnetic cores which are joined together to form a unified magnetic core and between abutment surfaces of which is formed a magnetic gap, characterized in that each of said paired magnetic cores has at least a portion thereof formed of single-crystal ferrite and extending to a sliding surface for sliding against a magnetic recording medium;

a main magnetic path forming surface of the single-crystal ferrite perpendicular to said abutment surfaces being constituted by a (110) plane, the sliding surface of each single-crystal ferrite core portion is constituted by a (100) plane perpendicular to said abutment surfaces, and a <100> crystal orientation of each single-crystal ferrite core portion is tilted at a non-zero angle of 26° or less relative to a depth direction of said gap.

6,016,244

SHOCK HAZARD PROTECTION SYSTEM

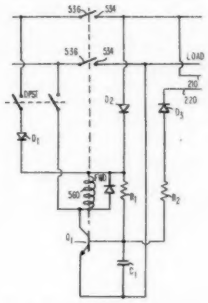
Bernard Gershen, Centerport; Saul Rosenbaum, East Meadow, and James N. Pearse, Dix Hills, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Continuation of application No. 08/726,252, Oct. 4, 1996, Pat. No. 5,801,912, which is a continuation of application No. 08/524,140, Sep. 6, 1995, Pat. No. 5,583,730, which is a continuation of application No. 08/410,952, Mar. 27, 1995, abandoned, which is a continuation of application No. 08/138,889, Oct. 19, 1993, Pat. No. 5,402,298, which is a continuation of application No. 07/979,759, Nov. 23, 1992, abandoned, which is a continuation of application No. 07/758,173, Sep. 11, 1991, Pat. No. 5,166,853, which is a continuation of application No. 07/618,271, Sep. 6, 1990, abandoned, which is a continuation of application No. 07/471,258, Jan. 26, 1990, abandoned, which is a continuation of application No. 07/352,077, May 15, 1989, abandoned, which is a continuation of application No. 07/185,571, Apr. 25, 1988, abandoned, which is a continuation of application No. 07/082,259, Aug. 6, 1987, abandoned, which is a continuation of application No. 07/001,715, Jan. 9, 1987, Pat. No. 4,709,293, which is a continuation of application No. 06/880,396, Jun. 30, 1986, abandoned, which is a continuation of application No. 06/558,260, Dec. 5, 1983, abandoned. This application Aug. 17, 1998, Appl. No. 135,220.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H02H *3/00*

U.S. Cl. 361—50 **5 Claims**



1. A circuit interrupting device for interrupting an electrical circuit between a source of AC energy and an electrical load upon the detection of an electrically conductive medium related to a shock hazard condition contained within said load comprising:

a) a first service conductor connected between a source of AC power and a first input to a load;

b) a first switch means in said first service conductor having a first closed position to pass AC power from said source to said load and a first open position where AC power is not passed to said load;

c) a second service conductor connected between said source of AC power and a second input to said load;

d) a second switch means in said second service conductor having a second closed position to pass AC power from said source to said load and a second open position where AC power is not passed to said load;

e) a first shock hazard detection conductor having a supply end and a free end, said supply end of said first shock hazard detection conductor coupled to said first service conductor;

f) a second shock hazard detection conductor having a second supply end and a second free end;

g) a conductor having a first end and a second end, said second end coupled to said supply end of said second shock hazard detection conductor;

h) a gate means having an input terminal, an output terminal and a control terminal, said first end of said conductor coupled to said control terminal of said gate means and said input terminal coupled to said first and second service conductors;

i) a coil coupled to said first and second switch means for controlling the positions of said first and second switch means, said coil having a first end and a second end, said second end coupled to said output terminal of said gate means;

j) a first set switch means coupled to said first service conductor at a first end and to said first end of said coil at a second end; said first set switch means having an open position to prevent the flow of current from said first service conductor to said first end of said coil and a closed position to permit the flow of current from said first service conductor to said first end of said coil;

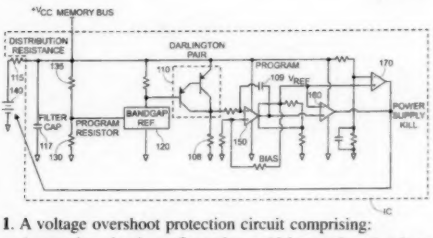
k) a second set switch means coupled to said second service conductor at a first end and to said second end of said coil at a second end, said second set switch means having an open position to prevent the flow of current from said second service conductor to said second end of said coil and a closed position to permit the flow of current from said second service conductor to said second end of said coil, whereby the moving of either the first and second set switch means or the first and second switch means to their closed positions causes current to flow in said coil and maintains said first and second switch means in their positions.

6,016,245

VOLTAGE OVERSHOOT PROTECTION CIRCUIT

Steven L. Ross, Lacey, Wash., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 13, 1998, Appl. No. 41,983
Int. Cl.[7] H02H *3/14*
U.S. Cl. 361—86 **16 Claims**



1. A voltage overshoot protection circuit comprising:

an integration circuit configuration, said integration circuit configuration being included in said circuit so as to integrate excess diverted current drawn from a bus;

said protection circuit being adapted to be electrically coupled to the bus, the voltage overshoot protection circuit including circuitry to detect the voltage overshoot, the circuitry to detect the voltage overshoot including a bandgap voltage reference source;

wherein the voltage overshoot protection circuit is capable of being programmed for both the bus voltage signal level trip point and the amount of energy to be absorbed;

wherein the voltage overshoot protection circuit includes the capability to respond to a voltage overshoot within on the order of a few microseconds.

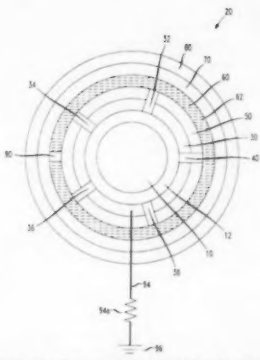
6,016,246

WRIST STRAP

George Theodore Dangelmayer, Plaistow, N.H.; Louis F. DeChiaro, Lanoka Harbor, N.J.; John Philip Franey, Bridgewater, N.J., and Min-Chung Jon, Princeton Junction, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 14, 1998, Appl. No. 211,180
Int. Cl.[7] H05F *3/02*
U.S. Cl. 361—220 **20 Claims**

1. An apparatus comprising:



a strap comprised of an outer layer which is shaped in the form of a closed loop and of a conductive inner layer;

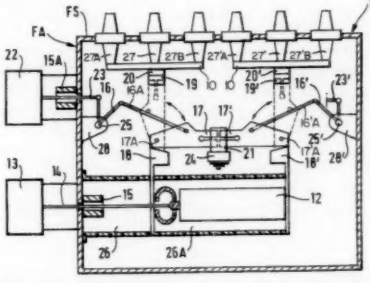
and a lotion dispensing device connected to the strap wherein the lotion dispensing device is within the outer layer of the strap.

6,016,247

ELECTRICITY DISTRIBUTION SUBSTATION

Joachim Dams, Mauguio, and Thierry Starck, Castries, both of France, assignors to GEC Alsthom T&D SA, Paris, France

Filed Apr. 7, 1998, Appl. No. 55,702
Claims priority, application France, Apr. 8, 1997, 97-04261
Int. Cl.[7] H02B *5/00*
U.S. Cl. 361—602 **6 Claims**



1. A medium voltage electricity distribution substation, implemented using a "one-and-a-half breaker" type circuit, obtained by associating circuit breakers and disconnectors in an arrangement enabling two distinct outgoing feeder cables to be fed from one and/or the other of two incoming feeder cables and/or overhead lines, wherein the arrangement is made up of three identical, gastight, cubicles in the form of adjacent rectangular parallelepipeds made of sheet metal, each of which receives a circuit breaker and two disconnectors electrically located on opposite sides of the circuit breaker, each cubicle having a top face including through orifices for electricity lead-ins enabling "link" tabs of the disconnectors to be connected by electrical conduction with conductive busbars and/or electrical cables outside the cubicle, said orifices being disposed obliquely in two parallel rows on the top face of the cubicle causing the lead-ins being disposed relative to the front face of the cubicle in a "front" first row of electricity lead-ins, and a "rear" second row of electricity lead-ins, the two outermost cubicles having in one case front lead-ins and in the other case rear lead-ins fitted for connection to the wires of an incoming feeder, whether an overhead line or a cable, the cubicle placed between the other two having firstly one row of lead-ins, either a front row or a rear row, connected by interconnection conductive busbars to the front lead-ins of the adjacent cubicle whose rear lead-ins are fitted for connection to an incoming feeder, and secondly the lead-ins of

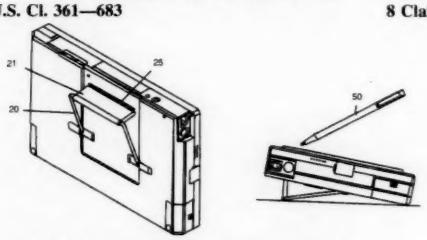
its other row connected by other interconnection busbars to the rear lead-ins of the adjacent cubicle whose front lead-ins are fitted for connection to an incoming feeder, two of the cubicles each having a row of lead-ins fitted to be connected simultaneously to the interconnection busbars connecting them to the lead-ins of another cubicle as mentioned, and to the cables of a respective different outgoing feeder.

6,016,248

HAND HELD TABLET COMPUTER HAVING EXTERNAL MECHANISMS FOR FACILITATING POSITIONING AND OPERATION

Masato Anzai, Machida; Nariaki Mieki, Yokohama, and Yoshinari Toyosato, Yamato, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 14, 1997, Appl. No. 891,925
Claims priority, application Japan, Aug. 19, 1996, 8-217559
Int. Cl.[7] G06F *1/16*; H05K *5/02*
U.S. Cl. 361—683 **8 Claims**



1. An information processing apparatus comprising:

a main body in a flat plane box shape;

a flat input section provided on the front surface of the main body;

a stand, provided on the rear surface of the main body, having two or more tilting positions relative to the main body and including a handle, formed of a U shaped rod; a pair of shafts, one formed at either end of the handle; bearings formed at the rear surface of the main body, for rotatively supporting the pair of shafts; a tongue piece, rotatively attached to the handle at approximately the center of the U shape of the rod; and an engagement portion formed at the rear surface of the main body, for engaging a tip of the tongue piece in the first tilt position.

6,016,249

HOUSING UNIT

Nobuhiro Ogawa, Kawasaki, and Masanori Tsukuda, Yashiromachi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

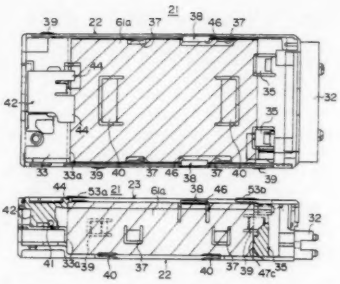
Filed Oct. 3, 1995, Appl. No. 538,212
Claims priority, application Japan, Mar. 16, 1995, 7-057795
Int. Cl.[7] G06F *1/16*
U.S. Cl. 361—685 **12 Claims**

1. A housing unit comprising:

a case housing a selected one of a first unit and a second unit the second unit having a height different from that of said first unit;

a resilient pressing portion extending from said case and including two portions that are stationary, each of the two portions engaging a respective, selected one of said first and second units;

a stopper portion rotatably connected to said case and including two holding portions, each of the two holding portions engaging a respective, selected one of said first and second units and said two portions of said resilient pressing portion resiliently pressing said respective, selected one of said first and



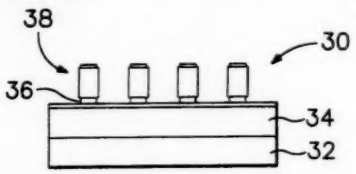
said second units toward said stopper portion so that the respective, selected one of said first and second units is retained in said case.

6,016,250

SELF-BALANCING THERMAL CONTROL DEVICE FOR INTEGRATED CIRCUITS

John C. Hanners, Brentwood, Calif., assignor to Credence Systems Corporation, Fremont, Calif.

Filed Jan. 30, 1998, Appl. No. 16,576
Int. Cl.[7] H05K *7/20*
U.S. Cl. 361—695 **6 Claims**



1. An apparatus for transferring heat from an integrated circuit device (IC) to air, the apparatus comprising:

a thermomorphic element that substantially changes its shape as it becomes warmer, and

a heat conductor attached to the IC and to said thermomorphic element for conducting heat from said IC to said thermomorphic element, the thermomorphic element transferring said heat into said air at a rate that varies substantially as it chances its shape,

wherein said thermomorphic element comprises:

a first layer of material, and

a second layer of material bonded to said first layer,

wherein said first layer of material and said second layer of material have differing coefficients of thermal expansion.

6,016,251

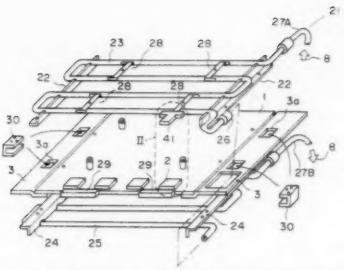
PRINTED CIRCUIT BOARD AND COOLING SYSTEM THEREFOR

Hiromichi Koide; Shinya Suzuki, and Tatsuaki Suzuki, all of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1998, Appl. No. 198,246
Claims priority, application Japan, Nov. 27, 1997, 9-326764
Int. Cl.[7] H05K *7/20*
U.S. Cl. 361—699 **18 Claims**

1. A printed circuit board comprising:

a unitary cooling line which is arranged on an upper face of the printed circuit board and a bottom face of the printed circuit board and which winds back and forth in a plane which is parallel to the printed circuit board in order for coolant to flow along the upper and bottom faces of the printed circuit board;



a first heat conducting member which makes contact with a component which is mounted on the printed circuit board;

a second heat conducting member which is detachably connected to the first heat conducting member and is detachably connected to the unitary cooling line by a connecting mechanism.

6,016,252

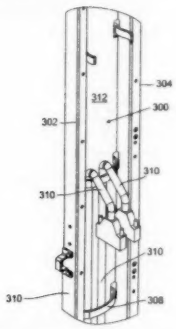
CABLE MANAGEMENT SYSTEM

Lawrence G. Pignolet, Woonsocket, R.I., and Jeffrey Teachout, Upton, Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Jun. 30, 1997, Appl. No. 885,386

Int. Cl.[7] **G06F** *1/16;* **H05K** *5/00*

U.S. Cl. 361—724 **13 Claims**



1. A cabinet for storing electrical equipment adapted for connection to a cable disposed in the cabinet, comprising:

a longitudinally extending channel disposed in the cabinet;

a fastener, comprising a strap, for: (a) opening and enabling the cable to be inserted into the channel; and (b) closing to retain such inserted cable within the channel; and

wherein such strap passing through slots formed in walls of the channel.

6,016,253

ELECTRONIC MODULE

Georg Seitz, Kasing; Joachim Lach, Neuburg; Ernst-Ludwig Klein, Lenting; Roland Wolfschläger, Roth, and Ekkehard Sachs, Spaichingen, all of Germany, assignors to Temic Telefunken Microelectronics GmbH, Heilbronn, and Marquardt GmbH, Rietheim-Weilheim, both of Germany

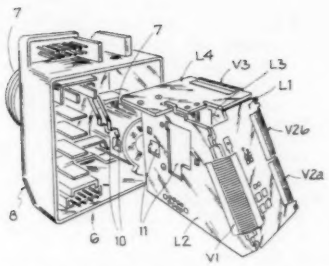
Filed Sep. 17, 1998, Appl. No. 154,822

Claims priority, application Germany, Sep. 18, 1997, 197 41 047

Int. Cl.[7] **H05K** *01/14*

U.S. Cl. 361—735 **5 Claims**

1. Electronic module comprising an operator control and/or actuator element and a three-dimensional circuit board arrangement consisting of several circuit board pieces with electronic components attached, where



a) the circuit board pieces are connected together electrically by means of film connectors,

b) the film connectors in the zones between the circuit board pieces have an elasticity which is such that the circuit board pieces are bent into a freely supported stable arrangement adapted to the three-dimensional form of the operator control and/or actuator element in a manner whereby the operator control and/or actuator element is partially enclosed by the circuit board pieces,

c) provision is made for connection points to connect the circuit board arrangement with the operator control and/or actuator element

d) and also means for closing and securing the circuit board arrangement in the three-dimensional form.

6,016,254

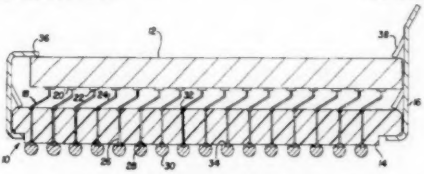
MOUNTING APPARATUS FOR GRID ARRAY PACKAGES

Wayne K. Pfaff, 309 Steeplechase, Irving, Tex. 75062

Filed Jul. 15, 1996, Appl. No. 680,170

Int. Cl.[7] **H05K** *07/12*

U.S. Cl. 361—769 **58 Claims**



1. Apparatus for mounting a grid array device package comprising:

(a) a top opening for insertion of a device package thereinto;

(b) a base member having a contact side and an interconnection side;

(c) a retaining member having a face substantially parallel with and spaced from the contact side of said base member; and

(d) a plurality of elongated contact pins supported in said base member, each pin having a contact end, an interconnection end, an intermediate portion extending between said contact end and said interconnection end with said contact end extending from said contact side of said base member, at least one bend in said intermediate portion between said contact end and said contact side, and the contact end of each pin arranged to terminate in a plane substantially parallel with and spaced from the contact side of said base member.

6,016,255

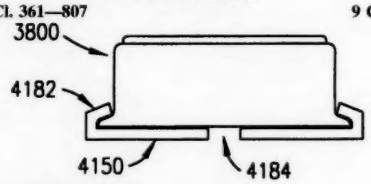
PORTABLE DATA CARRIER MOUNTING SYSTEM

Michael L. Bolan, Dallas, and Nicholas M. G. Fekete, Richardson, both of Tex., assignors to Dallas Semiconductor Corp., Dallas, Tex.

Continuation-in-part of application No. 08/022,258, Feb. 24, 1993, abandoned, which is a continuation-in-part of application No. 07/725,793, Jul. 9, 1991, abandoned, which is a continuation-in-part of application No. PCT/US90/02891, May 15, 1990, abandoned, application No. 07/615,606, Nov. 19, 1990, Pat. No. 5,206,905, application No. 07/615,615, Nov. 19, 1990, abandoned, application No. 07/615,608, Nov. 19, 1990, Pat. No. 5,226,137, application No. 07/882,244, May 8, 1992, Pat. No. 5,306,961, application No. 07/615,618, Nov. 19, 1990, abandoned, application No. 07/631,929, Dec. 19, 1990, Pat. No. 5,506,991, and application No. PCT/US91/03376, May 15, 1991, abandoned. This application Mar. 15, 1993, Appl. No. 31,776.

Int. Cl.[7] H05K 7/12

U.S. Cl. 361—807 9 Claims



1. A system comprising:

a portable data carrier in the form of a token having a flange, said token formed from two conductive surfaces separated by an insulating member, said token for housing an integrated circuit and a battery, said flange extending from one of said two conductive surfaces; and

an elastomeric element having a first arm and a second arm that can receivingly hold said token, said first arm and said second arm defining grooves that surround a portion of said token's flange, said portion having an upper surface and a lower surface, such that each of said upper surface and lower surface is covered by said elastomeric element.

6,016,256

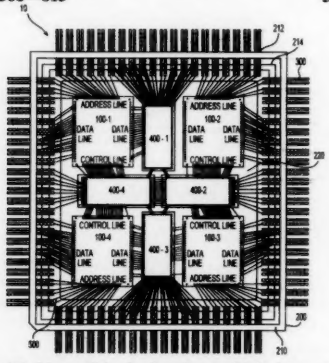
MULTI-CHIP MODULE HAVING INTERCONNECT DIES

Stanford W. Crane, Jr., Boca Raton; Lakshminarasimha Krishnapura, Delray Beach; Yun Li, Boca Raton; Moises Behar, Boca Raton; Dan Fuoco, Boca Raton, and Bill Ahearn, Boca Raton, all of Fla., assignors to The Panda Project, Boca Raton, Fla.

Filed Nov. 14, 1997, Appl. No. 970,379

Int. Cl.[7] H05K 5/00; H01L 23/053;23/057

U.S. Cl. 361—813 31 Claims



1. A multi-chip module for housing multiple integrated circuit dies comprising:

a housing;

a plurality of electrically conductive leads held in said housing, each of said conductive leads including an internal lead section extending within said housing and an external lead section extending outside of said housing;

a plurality of integrated circuit dies mounted within said housing; and

a plurality of interconnect dies mounted within said housing with at least two of said interconnect dies being electrically connected to respective ones of said internal lead sections of said electrically conductive leads, and said at least two interconnect dies being electrically connected to respective ones of said integrated circuit dies while being indirectly electrically connected to each other through at least a third interconnect die wherein said interconnect dies transmit signals between at least two of said integrated circuit dies and said conductive leads.

6,016,257

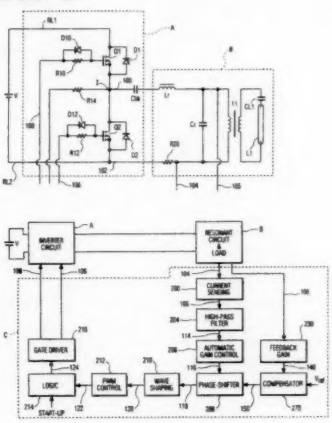
VOLTAGE REGULATED POWER SUPPLY UTILIZING PHASE SHIFT CONTROL

Chin Chang, Ossining; Joseph En-Cheng Chang, Norwich, and Gert W. Bruning, No. Tarrytown, all of N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation-in-part of application No. 08/773,243, Dec. 23, 1996, Pat. No. 5,781,418. This application Aug. 12, 1997, Appl. No. 909,922.

Int. Cl.[7] H02M 3/335

U.S. Cl. 363—17 15 Claims



1. A power supply, which comprises:

a) a resonant circuit having an output voltage and a current oscillating therethrough;

b) a voltage-fed half-bridge inverter producing a supply voltage at an output coupled to the resonant circuit, the inverter being responsive to a driving signal; and

c) a driving circuit producing the driving signal, the driving circuit comprising:

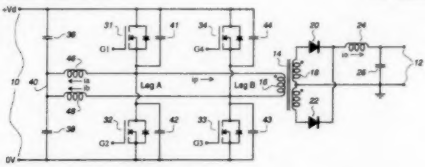
i) voltage compensation circuitry regulating said output voltage with respect to a reference voltage and commanding a phase shift angle; and

ii) phase-shifting circuitry applying a phase-shift to a sensed current signal, the amount of phase shift being commanded by the voltage compensation circuitry.

6,016,258
FULL BRIDGE DC-DC CONVERTERS

Praveen K. Jain, Pointe-Claire, and Harpreet Soin, Kanata, both of Canada, assignors to Nortel Networks Corporation, and Concordia University, both of Montreal, Canada

Filed Nov. 25, 1998, Appl. No. 199,415
Claims priority, application Canada, Oct. 2, 1998, 2249755
Int. Cl.[7] H02M *3/335;7/5387*
U.S. Cl. 363—17 **12 Claims**



1. A DC converter comprising:

a bridge having two switching legs, each comprising two controlled switching devices connected in series, each switching leg connected between two supply voltage terminals and having a junction point between its series-connected switching devices;

a transformer having a primary winding and a secondary winding, the primary winding being coupled between the junction points of the switching legs;

a rectifier and output filter circuit connected to the secondary winding for providing an output voltage of the converter;

four snubber capacitors each coupled in parallel with a respective one of the switching devices;

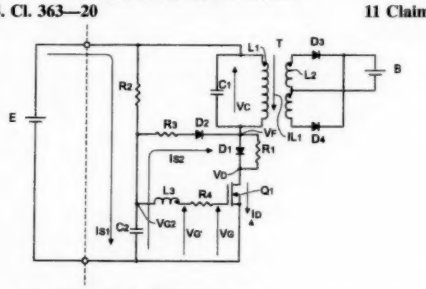
a first inductor coupled between the junction point of one of the switching legs and a point for providing a voltage between voltages of the supply voltage terminals; and

a second inductor coupled between the junction point of the other of the switching legs and a point for providing a voltage between voltages of the supply voltage terminals.

6,016,259
POWER SUPPLY CIRCUIT

Hideki Tamura, Moriyama, and Hideaki Abe, Neyagawa, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 24, 1997, Appl. No. 998,247
Claims priority, application Japan, Dec. 24, 1996, 8-342827
Int. Cl.[7] H02M *3/335;2/537*
U.S. Cl. 363—20 **11 Claims**



1. A power supply circuit, comprising:

a voltage driven type switching element having a control terminal for repeatedly changing between an ON state and an OFF state;

an LC resonant circuit connected to said switching element and has a predetermined resonant frequency;

a delay resistor directly connected to said control terminal of said switching element;

a feedback winding for applying a feedback voltage derived from a high frequency signal across said LC resonant circuit to said control terminal through said delay resistor, said feedback voltage being delayed by said delay resistor before being applied to said control terminal; and

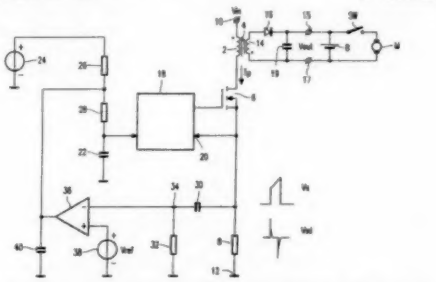
a bias circuit connected to said feedback winding for providing a bias voltage to said control terminal through said feedback winding and said resistor for alternately switching between said ON and Off states in combination with said feedback voltage;

wherein said voltage driven type switching element has an input impedance sufficiently higher than a source impedance of said feedback voltage in such a way that substantially no current flows into said control terminal of said switching element by said feedback voltage, and wherein said feedback voltage is delayed by a time defined by said delay resistor and an input capacitor of said switching element before being applied to said control terminal.

6,016,260
SWITCHED-MODE POWER SUPPLY WITH CURRENT AND VOLTAGE LIMITATION

Schelte Heeringa, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1998, Appl. No. 208,511
Claims priority, application European Pat. Off., Dec. 10, 1997, 97203864
Int. Cl.[7] H02M *3/335*
U.S. Cl. 363—21 **19 Claims**



1. A switched-mode power supply, comprising: a series arrangement of a controllable switching element and an inductive element connected to receive an input voltage (Vin), means for rendering the controllable switching element conductive during an on period so as to produce a current (Ip) through the series arrangement, which current increases from a minimum value at the beginning of the on period to a maximum value at the end of the on period, and for rendering the controllable switching element non-conductive during an off period, first means for limiting the maximum value of the current (Ip), wherein the switched-mode power supply further includes second means for limiting the minimum value of the current.

6,016,261
SWITCHING VOLTAGE CONVERTER WITH SYNCHRONOUS RECTIFICATION

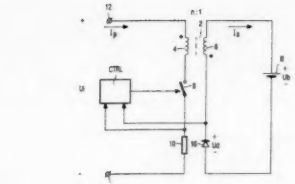
Johannes De Wit; Wilhelmus G. M. Ettes; Roelf Van Der Wal, and Jacob H. Botma, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

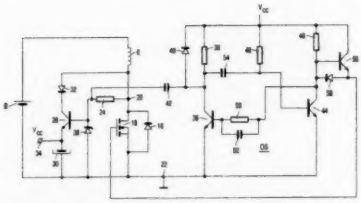
Filed Feb. 1, 1999, Appl. No. 240,815
Claims priority, application European Pat. Off., Feb. 3, 1998, 98200306
Int. Cl.[7] H02M *3/335*
U.S. Cl. 363—21 **8 Claims**

1. A switched-mode power supply, comprising:

an inductive element;

a first electronic switch coupled to the inductive element to produce current flow therein during an on period in which the first electronic switch is conductive;





a parallel combination of a diode and a second electronic switch also coupled to the inductive element to produce current flow in the inductive element during an off period in which the first electronic switch is non-conductive, said current flow being in parallel in electrically consistent directions through said diode and the second electronic switch; and

means (OS) for turning off the second electronic switch after a fixed activation interval following commencement of said off period, said activation interval having a length somewhat smaller than but otherwise independent of the length of said off period.

6,016,262

CONVERTER EQUIPMENT

Bert Karlsson, Västerås, Sweden, assignor to DaimlerChrysler AG, Stuttgart, Germany

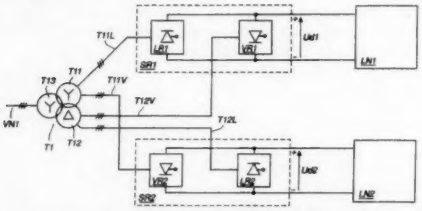
PCT No. PCT/SE97/00106, § 371 Date Sep. 3, 1998, § 102(e) Date Sep. 3, 1998, PCT Pub. No. WO97/27664, PCT Pub. Date Jul. 31, 1997

PCT Filed Jan. 22, 1997, Appl. No. 101,319

Claims priority, application Sweden, Jan. 23, 1996, 9600232

Int. Cl.[7] **H02M** *7/00;3/337*

U.S. Cl. 363—67 **10 Claims**



1. Converter equipment with a number of double converters (**SR1**, **SR2**), in which ac terminals of each double converter are arranged for connection to a first alternating-voltage network (**VN1**) via first transformer equipment (**T1**), which has two separate secondary windings, namely, a first (**T11**) and a second (**T12**) secondary winding, and dc terminals of said each double converter are arranged for connection to a direct-voltage network (**LN1**, **LN2**), and wherein each double converter has a first converter (**VR1**, **VR2**) adapted to operate at a certain direction of the direct current of the double converter and a second converter (**LR1**, **LR2**) adapted to operate at an opposite direction of the direct current, characterized in that

the converter equipment comprises a first and a second double converter (**SR1**, **SR2**), which are connected to different direct-voltage networks (**LN1**, **LN2**) and adapted to operate with mutually identical power directions,

the first secondary winding (**T11**) is connected to the first converter (**VR1**) of the first double converter (**SR1**) and to the second converter (**LR2**) of the second double converter (**SR2**),

the second secondary winding (**T12**) is connected to the first converter (**VR2**) of the second double converter (**SR2**) and to the second converter (**LR1**) of the first double converter (**SR1**).

6,016,263

STORAGE DEVICE DESIGNED FOR USE WITH PC SYSTEM AND FORMED OF RAM MODULE

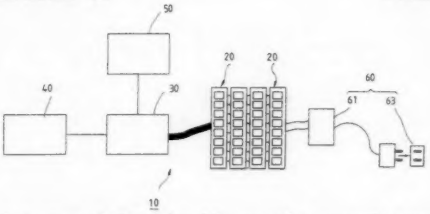
Hui-Ju Chen, No. 5-27, Chung She Road, Ching Shui Chen, Taichung Hsien, Taiwan

Filed Jun. 16, 1999, Appl. No. 333,982

Claims priority, application Taiwan, May 19, 1999, 88108162

Int. Cl.[7] **H01L** *27/108*

U.S. Cl. 365—51 **9 Claims**



1. A storage device designed for use with a personal computer system and formed of one or more RAM modules, said storage device comprising:

at least one RAM module;

a memory accessing unit connected with said RAM module for storing data in a predetermined address in said RAM module, or retrieving data from a predetermined address in said RAM module;

a data accessing interface compatible with a hard disk accessing interface of the personal computer and connected with said memory accessing unit so as to output data stored in said RAM module to the personal computer system through control of said memory accessing unit, and to input data of the computer system to a predetermined address in said RAM module through control of said memory accessing unit;

a command translating unit connected with said memory accessing unit and said data accessing interface for translating a control machine code of the hard disk of the personal computer system into a control machine code of said memory accessing unit; and

a power unit connected with said RAM module for providing said RAM module with a continuous supply of power enabling a continuous storage of the data in said RAM module;

said storage device storing an operating system or application program, which is quickly executed through said RAM module having an accessing speed faster than that of the hard disk.

6,016,264

ANTIFUSE PROGRAMMING AND DETECTING CIRCUIT

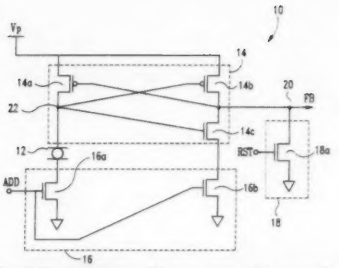
Ming-Zen Lin, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Taiwan

Filed May 26, 1998, Appl. No. 85,332

Int. Cl.[7] **G11C** *17/00;7/00*

U.S. Cl. 365—96 **15 Claims**

1. An antifuse programming and detecting circuit comprising:



an antifuse being programmable at an open state or a short state;

a latch circuit coupled with a power supply, said latch circuit providing and latching an output signal by detecting an antifuse state, said latch circuit comprising a first transistor, a second transistor, and a third transistor, said first transistor and said second transistor being cross-coupled with sources coupled to said power supply and with gates cross-coupled to drains, said drain of said first transistor being coupled to said antifuse, said third transistor having two terminals coupled between said drain of said second transistor and a ground connection, and having a gate coupled to said drain of said first transistor;

a programming circuit for setting said antifuse state; and

a reset circuit for resetting said output signal.

6,016,265

FUSE-LATCH CIRCUIT HAVING HIGH INTEGRATION DENSITY

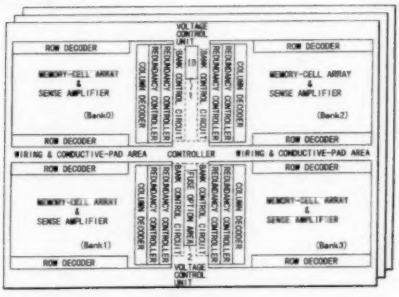
Munehiro Yoshida, and Ryouji Kotani, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 10, 1998, Appl. No. 209,120

Claims priority, application Japan, Dec. 12, 1997, 9-343077

Int. Cl.[7] G11C *8/00*

U.S. Cl. 365—96 **13 Claims**



1. A semiconductor integrated circuit apparatus comprising:

a plurality of read-only memory devices arranged in one column; and

a plurality of data-reading circuits arranged in two columns and connected to the read-only memory devices, respectively, for reading data stored by the read-only memory devices,

wherein said read-only memory devices are connected, alternately to the data-reading circuits of one of said two columns and the data-reading circuits of the other column.

6,016,266

SEMICONDUCTOR DEVICE WITH A FERROELECTRIC CAPACITOR

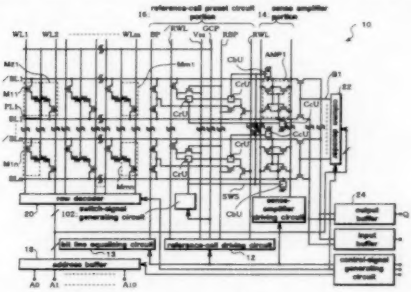
Kiyoshi Nishimura, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Dec. 8, 1997, Appl. No. 986,536

Claims priority, application Japan, Dec. 9, 1996, 8-328092

Int. Cl.[7] G11C *11/22*

U.S. Cl. 365—145 **20 Claims**



1. A semiconductor device comprising:

first and second sections to which first and second voltages can be applied to establish a polarity;

a ferroelectric capacitor having first and second ends, said ferroelectric capacitor being electrically connected with said first and second sections in a first direction when said first end of said ferroelectric capacitor is in electrical communication with said first voltage rather than said second voltage and in a second direction when said second end of said ferroelectric capacitor is in electrical communication with said second voltage rather than said first voltage; and

mechanism which can change said ferroelectric capacitor being electrically connected with said first and second sections between said first and second directions without a change in said polarity.

6,016,267

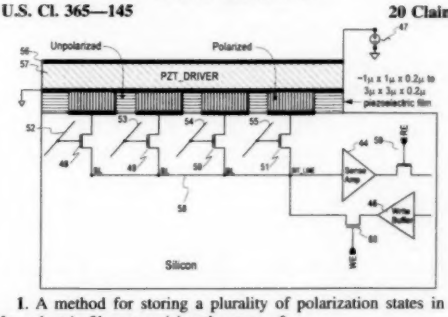
HIGH SPEED, HIGH BANDWIDTH, HIGH DENSITY, NONVOLATILE MEMORY SYSTEM

Ferenc Miklos Bozso, Ridgefield, and Philip George Emma, Danbury, both of Conn., assignors to International Business Machines, Armonk, N.Y.

Filed Feb. 17, 1998, Appl. No. 24,759

Int. Cl.[7] G11C *11/22*

U.S. Cl. 365—145 **20 Claims**



1. A method for storing a plurality of polarization states in a ferroelectric film comprising the steps of:

providing a data storage structure comprising a single contiguous layer of ferroelectric material having a first surface and a second surface, an array of first metal plates being disposed on the first surface of the single contiguous ferroelectric layer, wherein each first metal plate in the array corresponds to a

single data bit cell comprising a separate spatial region within the single contiguous ferroelectric layer for storing a single bit of data;

providing a single contiguous second metal plate disposed on the second surface of the single contiguous ferroelectric layer;

applying a voltage across the single contiguous ferroelectric layer by connecting the single contiguous second metal plate to a reference voltage; and

connecting each of said first metal plates to either a positive or negative voltage source, corresponding to the value of a data bit to be stored in the corresponding cell so as to cause positive or negative polarizations of the spatial regions in the single contiguous ferroelectric layer corresponding to the particular first metal plate.

6,016,268

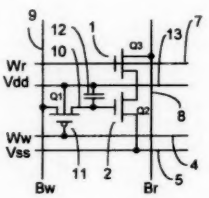
THREE TRANSISTOR MULTI-STATE DYNAMIC MEMORY CELL FOR EMBEDDED CMOS LOGIC APPLICATIONS

Eugene Robert Worley, Irvine, Calif., assignor to Richard Mann, a part interest

Provisional application No. 60/038,095, Feb. 18, 1997. This application Feb. 5, 1998, Appl. No. 19,186.

Int. Cl.[7] G11C *11/24*

U.S. Cl. 365—149 **15 Claims**



1. A semiconductor memory cell comprising

a plurality of 3 transistor dynamic memory cells arranged in one ore more columns for storing data,

one bit line for writing data and one bit line for reading data stored in the cell,

a plurality of word row select lines for writing data and a plurality of word row select lines for reading data,

a writing means which can place from one to several different levels into said cell for the purpose of storing one or more bits per cell,

a reading means which can read levels of said memory cell and output a digital word corresponding to said levels, and

a refresh means which can read said cell and re-write the read data back into said cell; wherein

said three transistor memory cell comprises a first transistor of P type whose gate is tied to the write word line, whose drain/source is connected to the write bit line, and whose other drain/source node is connected to a storage node comprising a transistor gate of a second transistor and a capacitor, the second transistor being of N type whose gate is connected to the storage node, whose drain/source node is connected to ground or Vss and whose other drain/source is connected to a drain/source of a third transistor, the third transistor of N type whose gate is connected to the read word select line, whose drain/source is connected to the drain/source of the second transistor, and whose other drain/source is connected to the read bit line.

6,016,269

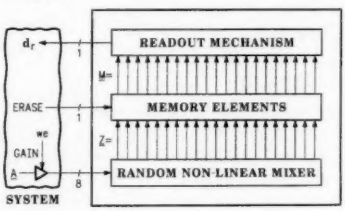
QUANTUM RANDOM ADDRESS MEMORY WITH MAGNETIC READOUT AND/OR NANO-MEMORY ELEMENTS

William M. Peterson, Chandler, and Eugene Y. Chen, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1998, Appl. No. 163,880

Int. Cl.[7] G11C *11/14*

U.S. Cl. 365—171 **17 Claims**



1. A quantum random address memory comprising:

a plurality of address ports providing a low dimensional plurality of addresses;

data output structure;

a plurality of magnetic nano-memory elements;

a plurality of pseudo-randomly positioned, non-linear mixer elements coupling one of the plurality of address ports and the data output structure to a high dimensional plurality of the plurality of magnetic nano-memory elements; and

the other of the plurality of address ports and the data output structure being coupled to the plurality of magnetic nano-memory elements, wherein the high dimensional plurality of magnetic nano-memory elements is greater than the low dimensional plurality of addresses.

6,016,270

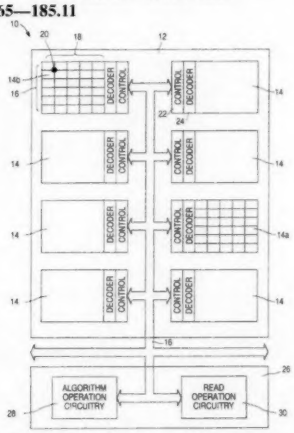
FLASH MEMORY ARCHITECTURE THAT UTILIZES A TIME-SHARED ADDRESS BUS SCHEME AND SEPARATE MEMORY CELL ACCESS PATHS FOR SIMULTANEOUS READ/WRITE OPERATIONS

Damodar Reddy Thummalapally, San Jose, and Abhijit Ray, Santa Clara, both of Calif., assignors to Alliance Semiconductor Corporation, San Jose, Calif.

Filed Mar. 6, 1998, Appl. No. 36,558

Int. Cl.[7] G11C *16/04*

U.S. Cl. 365—185.11 **12 Claims**



1. Flash EEPROM circuitry that includes a flash memory cell array that is subdivided into a plurality of array blocks, and wherein each array block includes a plurality of flash memory cells, the flash EEPROM circuitry comprising:

an address bus connected to each array block for providing address information to the array blocks;

erase/reprogram operation circuitry connected to said address bus, the erase/reprogram operation circuitry being responsive to erase/reprogram operation address information provided on said address bus, the erase/reprogram operation address information identifying a first array block in which an erase/reprogram operation is to be performed, by performing the erase/reprogram operation in the first array block;

read operation circuitry connected to said address bus, the read operation circuitry being responsive to read operation address information provided on said address bus during performance of the erase/reprogram operation in the first array block, the read operation address information identifying a second array block in which a read operation is to be performed, by performing the read operation in the second array block simultaneously with the erase/reprogram operation being performed in the first array block.

6,016,271

METHOD AND CIRCUIT FOR GENERATING A GATE VOLTAGE IN NON-VOLATILE MEMORY DEVICES

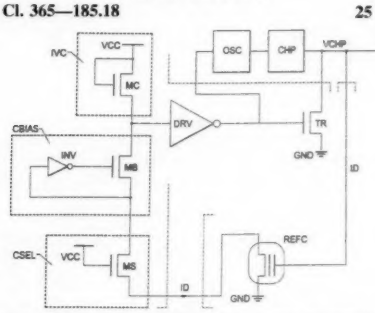
Paolo Rolandi, Voghera; Roberto Gastaldi, Agrate Brianza, and Cristiano Calligaro, Torre D'Isola, all of Italy, assignors to STMicroeletronics S.R.L., Agrate Brianza, Italy

Filed Aug. 27, 1998, Appl. No. 141,250

Claims priority, application European Pat. Off., Aug. 29, 1997, 97830435

Int. Cl.[7] **G11C** *16/04*

U.S. Cl. 365—185.18 **25 Claims**



1. A circuit for generating a regulated voltage for gate terminals of non-volatile memory cells of a floating gate type, comprising:

a generator circuit adapted to generate an unregulated voltage on an output thereof;

a comparator circuit coupled to the output of the generator circuit and adapted to output an error signal based upon a difference between the unregulated voltage and an internal reference voltage;

a regulator circuit coupled to the output of the comparator circuit and operative to regulate the unregulated voltage based on the value of the error signal, said regulator circuit including a transistor having a source, drain and gate, said gate of said transistor connected to a power supply;

said comparator circuit comprising a reference non-volatile memory cell of the floating gate type having a threshold voltage corresponding to the internal reference voltage, and wherein said reference non-volatile memory cell includes a drain connected to said source of the transistor in the regulator circuit; and

a circuit for biasing the drain of the reference non-volatile memory cell, wherein the non-volatile memory reference cell before the start of any voltage regulating operation is programmed at a threshold voltage RV1 corresponding to a value intermediate distributions "01" and "00" and between about 4.5 and 6.2 volts.

6,016,272

HIGH-PRECISION ANALOG READING CIRCUIT FOR FLASH ANALOG MEMORY ARRAYS USING NEGATIVE FEEDBACK

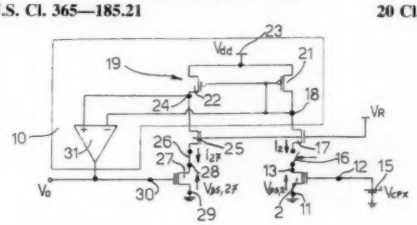
Danilo Gerna, Montagna In Valtellina; Roberto Canegallo, Tortona; Ernestina Chioffi, Pavia; Marco Pasotti, S. Martino Siccomario, and Pier Luigi Rolandi, Monleale, all of Italy, assignors to STMicroelectronicsS. r. l., Agrate Brianza, Italy

Filed Apr. 14, 1998, Appl. No. 60,165

Claims priority, application European Pat. Off., Apr. 14, 1997, 978301723

Int. Cl.[7] **G11C** *16/06*

U.S. Cl. 365—185.21 **20 Claims**



1. A high-precision analog reading circuit for reading memory cells, in particular flash cells, comprising a first and a second cell, said first cell is an array cell to be read and said second cell is a reference cell, each cell having a first and a second terminal and a control terminal, first and second current source means connected to said first and second cells respectively and generating first and second currents respectively that are equal to each other, and negative feedback means having a first and a second input connected to said first terminal of said first cell and to said first terminal of said second cell respectively and an output connected to said control terminal of said second cell.

6,016,273

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

Koichi Seki, Hino; Takeshi Wada, Akishima; Tadashi Muto, Iruma; Kazuyoshi Shoji; Yasurou Kubota, both of Akishima, and Hitoshi Kume, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of application No. 08/456,797, Jun. 1, 1995, Pat. No. 5,781,476, which is a continuation of application No. 08/249,899, May 26, 1994, Pat. No. 5,844,842, which is a continuation-in-part of application No. 08/144,500, Nov. 2, 1993, abandoned, which is a continuation of application No. 07/474,994, Feb. 5, 1990, abandoned, which is a continuation-in-part of application No. 07/888,447, May 28, 1992, abandoned, which is a continuation of application No. 07/567,391, Aug. 14, 1990, abandoned. This application Sep. 27, 1996, Appl. No. 720,060.

Claims priority, application Japan, Feb. 6, 1989, 1-27271; Aug. 15, 1989, 1-210262; Sep. 20, 1989, 1-243603; Dec. 8, 1989, 1-317477; Jan. 25, 1990, 2-13614

Int. Cl.[7] **G11C** *11/34*

U.S. Cl. 365—185.22 **9 Claims**

1. A system comprising:

an address bus;

a data bus;

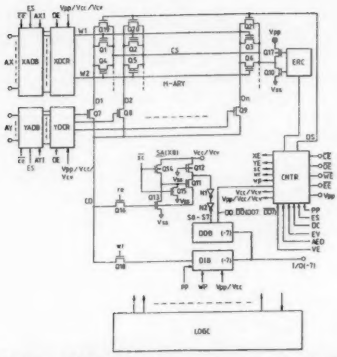
a microprocessor coupled to the address and the data bus; and

a nonvolatile memory device coupled to the address and the data bus, wherein the memory device is formed on a semiconductor chip which is separate from the microprocessor,

wherein the memory device includes:

a plurality of storage MOSFETs storing information as threshold voltages, the threshold voltages of the plurality of storage MOSFETs being changed from a first range toward a second range by erase operations;

a control circuit which performs a first control operation to execute the erase operations and to execute a verify opera-



tion for verifying whether or not the threshold voltages of the storage MOSFETs are in the second range after the erase operations,

wherein the control circuit performs a second control operation to execute the erase operations again to the storage MOSFETs if it is detected, in the verify operation, that the threshold voltages of the storage MOSFETs are not in the second range, and

wherein the first and second control operations are carried out by the control circuit without further control of the control circuit by the microprocessor; and

an output circuit which outputs information relating to a result of the verify operations in response to a signal from the microprocessor.

6,016,274

SEMICONDUCTOR MEMORY DEVICE

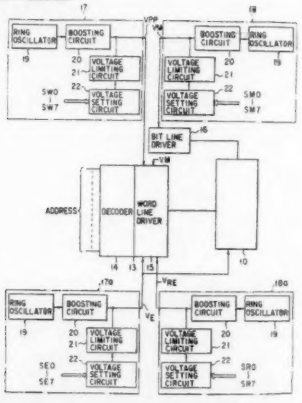
Yasuo Itoh, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 08/402,055, Mar. 10, 1995, Pat. No. 5,784,315. This application Mar. 20, 1998, Appl. No. 44,989.

Claims priority, application Japan, Mar. 11, 1994, 6-040935

Int. Cl.[7] G11C *16/00*

U.S. Cl. 365—185.29 **15 Claims**



8. A semiconductor memory device comprising:

a memory cell array having a plurality of nonvolatile memory cells arranged in a matrix;

means for erasing the memory cells during an erase operation with an erasing voltage which is supplied to the memory cells, the erase operation being repeated until erasing is completed;

means for verifying a status of the memory cells; and

means for adjusting the erasing voltage in accordance with a number of times the erase operation is repeated by said erasing means until the erasing is completed.

6,016,275

FLASH MEMORY WEAR LEVELING SYSTEM AND METHOD

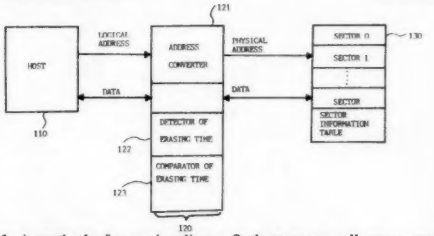
Sang-Wook Han, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Nov. 4, 1998, Appl. No. 185,709

Claims priority, application Rep. of Korea, Mar. 13, 1998, 98-8487

Int. Cl.[7] G11C *13/00*

U.S. Cl. 365—185.29 **19 Claims**



1. A method of wear leveling a flash memory cell array, comprising the steps of:

detecting the time required to complete an erasing operation on a sector of the memory cell array; and

determining whether to continue using the sector based on the detected erasing time.

6,016,276

SEMICONDUCTOR MEMORY DEVICE WHICH CAN BE SET ONE FROM MULTIPLE THRESHOLD VALUE

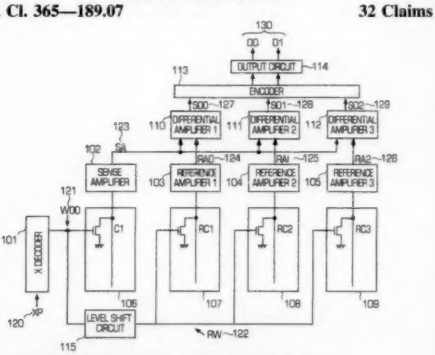
Yukio Fuji, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 18, 1998, Appl. No. 99,404

Claims priority, application Japan, Jun. 20, 1997, 9-163912

Int. Cl.[7] G11C *16/04*

U.S. Cl. 365—189.07 **32 Claims**



1. A semiconductor memory device comprising:

a memory cell in which one threshold value is set out of n (n is an integer of 2 or more) kinds of threshold values;

a word line connected to a gate of said memory cell;

a decoder for selecting said word line;

a sense amplifier for amplifying an output of said memory cell;

n−1 reference cells in which n−1 kind of threshold values are respectively set;

n−1 reference amplifiers for amplifying each outputs of said reference cells;

n−1 differential amplifiers for receiving the respective outputs of said reference amplifiers and an output of said sense amplifier;

an encoder for encoding an output of said n−1 differential amplifiers; and

a level shift circuit connected to said word line and supplying a voltage to gates of all said reference cells, said voltage being lower than the voltage supplied with said word line by half of adjacent threshold voltage values.

6,016,277

REFERENCE VOLTAGE GENERATOR FOR READING A ROM CELL IN AN INTEGRATED RAM/ROM MEMORY DEVICE

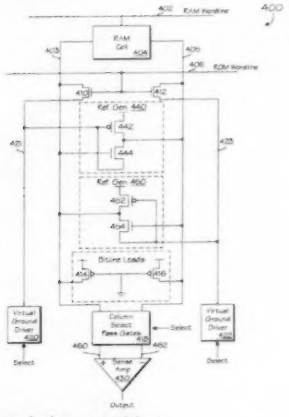
George M. Ansel, Starkville; Jeffery S. Hunt, Ackerman; Satish Saripella, Starkville; Sudhaker Reddy Anumula, Starkville, and Ajay Srikrishna, Starkville, all of Miss., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Jun. 27, 1997, Appl. No. 884,581

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G11C *7/06*

U.S. Cl. 365—189.09 **18 Claims**



12. A memory device, comprising:

a random access memory (RAM) cell coupled between a pair of bitlines, the bitlines providing input paths to a sense amplifier within the memory device;

a pair of read only memory (ROM) cells, each of the ROM cells being coupled to a respective one of the bitlines; and

a reference voltage generator having inputs and outputs, wherein a first of the inputs is coupled to receive a first sense amplifier input voltage; and a first of the outputs is coupled to provide a second sense amplifier input voltage differing from the first sense amplifier input voltage.

6,016,278

FAILURE ANALYSIS METHOD AND DEVICE

Toshikazu Tsutsui, Tokyo, and Masaaki Furuta, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Engineering Corporation, Itami, both of Japan

Filed Apr. 7, 1998, Appl. No. 55,905

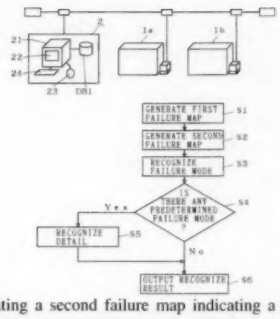
Claims priority, application Japan, Oct. 2, 1997, P09-269712

Int. Cl.[7] G11C *7/00*

U.S. Cl. 365—200 **18 Claims**

1. A failure analysis method comprising the steps of:

(a) generating a first failure map indicating a position of a failure bit in a semiconductor device;



(b) generating a second failure map indicating a position of a failure block in said first failure map by dividing said first failure map into a plurality of blocks;

(c) selecting an aggregate consisting of at least one of said blocks from said second failure map; and

(d) analyzing said semiconductor device by using an area corresponding to said aggregate in said first failure map.

6,016,279

DRAM SENSING SCHEME AND ISOLATION CIRCUIT

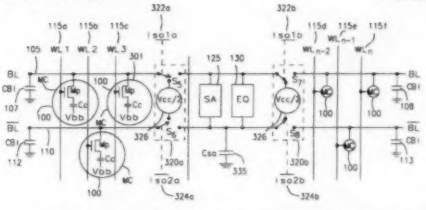
Min-Hwa Chi, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Mar. 30, 1998, Appl. No. 50,212

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G11C *7/00*

U.S. Cl. 365—203 **7 Claims**



1. An isolation pre-charge circuit within a DRAM array to pre-charge portions a pair of bit lines within said DRAM array to a voltage level of a reference voltage source and to connect a selected DRAM cell to a latching sense amplifier, comprising:

a) a first single pole double throw switch including a common terminal connected to one portion of one of the bit lines of the pair of bit lines, a first pole connect to the reference voltage source, a second pole connected to a first terminal of the latching sense amplifier and a first terminal of a pre-charge and equalization circuit, and a control terminal connected to a control circuit to selectively couple the common terminal to the first pole and the second pole; and

b) a second single pole double throw switch including a common terminal connected to one portion of a second of the bit lines of the pair of bit lines, a first pole connect to the reference voltage source, a second pole connected to a second terminal of the latching sense amplifier and a second terminal of a pre-charge and equalization circuit, and a control terminal connected to a control circuit to selectively couple the common terminal to the first pole and the second pole.

6,016,280

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

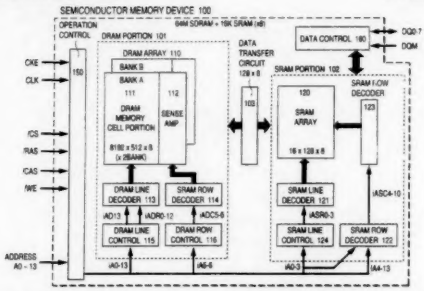
Taketo Maesako; Kouki Yamamoto; Yoshinori Matsui, and Kenichi Sakakibara, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 16, 1998, Appl. No. 153,533

Claims priority, application Japan, Sep. 16, 1997, 9-290235

Int. Cl.[7] G11C *7/00*

U.S. Cl. 365—226 **4 Claims**



1. A semiconductor memory device comprising a main memory portion, a sub memory portion composed of a plurality of memory cell groups and a bi-directional data transfer circuit provided between said main memory portion and said sub memory portion, wherein power source voltages of said main memory portion and said sub memory portion are different from each other.

6,016,281

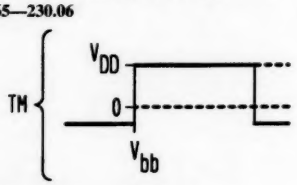
MEMORY WITH WORD LINE VOLTAGE CONTROL

Martin Brox, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 17, 1997, Appl. No. 992,378

Int. Cl.[7] G11C *8/00*

U.S. Cl. 365—230.06 **14 Claims**



7. A memory system comprising:

a first transistor having its conduction path connected between a first signal terminal and an output terminal;

means connecting the output terminal to the gate electrodes of a row of memory cells;

a second transistor having its conduction path connected between said output terminal and a second terminal;

means for applying a first decoded signal to the gate electrodes of said first and second transistors;

means for applying a second decoded signal to the first signal terminal;

means for selectively applying a first voltage or a second voltage to said second terminal, said first voltage having an amplitude and polarity to turn-off any memory cell transistor having its gate electrode connected to said output terminal and said second voltage having an amplitude and polarity to further turn-off said memory cell transistors.

6,016,282

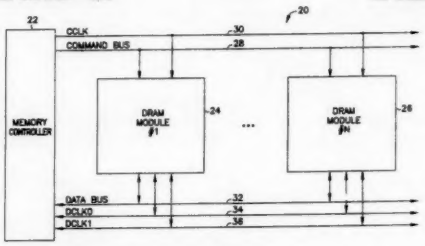
CLOCK VERNIER ADJUSTMENT

Brent Keeth, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 28, 1998, Appl. No. 86,401

Int. Cl.[7] G11C *13/00*

U.S. Cl. 365—233 **62 Claims**



1. An integrated circuit, comprising:

a vernier clock adjustment circuit receiving an input clock signal, the vernier clock adjustment circuit including a rising-edge delay circuit receiving the input clock signal and providing a rising-edge clock signal representing the input clock signal delayed by a rising-edge delay, the vernier clock adjustment circuit further including a falling-edge delay circuit receiving the rising-edge clock signal and providing a falling-edge clock signal representing the input clock signal delayed by a falling-edge delay; and

an edge triggered circuit receiving a binary signal, the rising-edge clock signal and the falling-edge clock signal, the edge triggered circuit performing a first operation on the binary signal at a first edge of the rising-edge clock signal and performing a second operation at a second edge of the falling-edge clock signal.

6,016,283

MULTIPLE DATA RATE SYNCHRONOUS DRAM FOR ENHANCING DATA TRANSFER SPEED

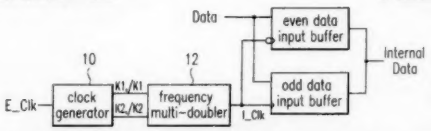
Yong Gwon Jeong, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Dec. 29, 1998, Appl. No. 222,229

Claims priority, application Rep. of Korea, Dec. 31, 1997, 97-81267

Int. Cl.[7] G11C *8/00*

U.S. Cl. 365—233 **5 Claims**



1. A multiple data rate memory device for receiving data, comprising:

a clock signal generator means for receiving an external clock of a frequency f and outputting a plurality of clocks;

a frequecy multi-doubler for logically operating the plurality of clocks and outputting an internal clock of a frequency 2Nf, N is natural number;

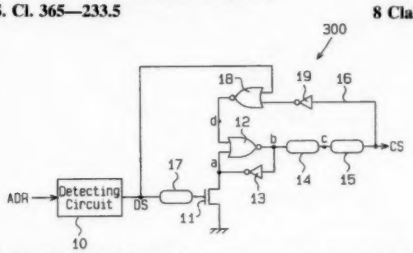
an odd data input buffer for receiving tha data at the rising edge of the internal clock; and

an even data input buffer for receiving tha data at the falling edge of the internal clock.

6,016,284
ADDRESS TRANSITION DETECTOR FOR MEMORY DEVICE

Toshihiro Itagaki, and Sadao Yoshikawa, both of Gifu-ken, Japan, assignors to Sanyo Electric Company, Ltd., Osaka, Japan

Filed Mar. 24, 1999, Appl. No. 275,737
Claims priority, application Japan, Mar. 30, 1998, 10-083633
Int. Cl.[7] G11C *8/00*
U.S. Cl. 365—233.5 **8 Claims**



6. An address transition detector for a memory device having a plurality of memory cells, the address transition detector comprising:

a detection circuit for detecting a change in an address signal which specifies an address of one of the plurality of memory cells and produces a detection signal in response thereto;

a first delay circuit having an input connected to said detection circuit for delaying the detection signal and producing a delayed detection signal;

a transistor having a gate connected to said first delay circuit and receiving the delayed detection signal, a source connected to ground, and a drain;

a first logic gate having a first input terminal connected to the drain of said transistor, and a second input terminal and an output terminal;

a first inverter having an input terminal connected to the output of said first logic gate and an output terminal connected to a node between the drain of said transistor and said first input terminal of the first logic gate;

a second delay circuit connected to the output terminal of said first logic gate;

a third delay circuit connected to an output of said second delay circuit;

a second inverter having an input terminal connected to an output of said third delay circuit; and

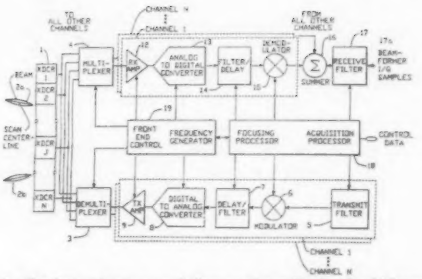
a second logic gate having a first input terminal connected to an output of said second inverter, a second input terminal connected to a node between said detection circuit and said first delay circuit, and an output terminal connected to the second input terminal of said first logic gate.

6,016,285
METHOD AND APPARATUS FOR COHERENT IMAGE FORMATION

J. Nelson Wright, Menlo Park; Samuel H. Maslak, Woodside; David J. Finger, San Jose, and Albert Gee, Los Altos, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Continuation of application No. 08/806,922, Feb. 26, 1997, Pat. No. 5,793,701, which is a division of application No. 08/418,640, Apr. 7, 1995, Pat. No. 5,667,373, which is a continuation of application No. 08/286,510, Aug. 5, 1994, abandoned. This application Jul. 29, 1998, Appl. No. 124,706.
Int. Cl.[7] G03B *42/06*
U.S. Cl. 367—11 **18 Claims**

1. A method for processing signals from an ultrasound receive beamformer which generates beamformed samples associated with first and second transmit events, said method comprising:



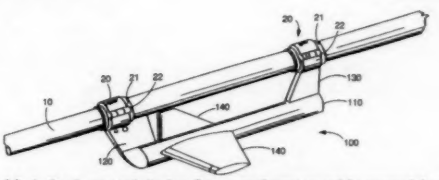
(a) adjusting at least one of phase and amplitude of said beamformed samples to effect coherence between samples associated with said first and second transmit events; and

(b) filtering said samples.

6,016,286
DEPTH CONTROL DEVICE FOR AN UNDERWATER CABLE

André W. Olivier, River Ridge; Bryant G. Ragan, Metairie, and James T. Cronvich, Harahan, all of La., assignors to Input/Output, Inc., Stafford, Tex.

Provisional application No. 60/049,450, Jun. 12, 1997. This application Jun. 10, 1998, Appl. No. 94,487.
Int. Cl.[7] G01V *1/38*
U.S. Cl. 367—17 **25 Claims**



14. A depth control device for an underwater cable comprising:

a hollow body for attachment to an underwater cable;

a drive shaft having a rotational axis and extending to an exterior of the body through openings in the body;

first and second wings disposed outside the body on opposite sides thereof and mounted on the drive shaft for rotation therewith; and

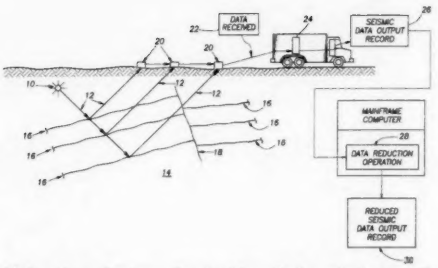
an actuator assembly disposed in the body and engaging the drive shaft to rotate the drive shaft about the rotational axis of the drive shaft, the drive shaft being disengageable from the actuator assembly and removable from the body through one of the openings in the body.

6,016,287
APPARATUS AND METHOD FOR ACCURATELY DETERMINING THE LOCATION OF EVENTS SUCH AS PEAKS IN SEISMIC DATA

Eric F. Klebba, Pearland, and Peter P. Van Bemmel, Houston, both of Tex., assignors to GeoQuest, a division of Schlumberger Technology Corporation, Houston, Tex.

Provisional application No. 60/084,587, May 7, 1998. This application Aug. 19, 1998, Appl. No. 136,599.
Int. Cl.[7] G01V *1/30*
U.S. Cl. 367—72 **24 Claims**

1. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for accurately locating a particular event of a plurality of events in a particular seismic trace among a plurality of seismic traces, said method steps comprising the steps of:



(a) locating a best sample of said particular seismic trace that lies within a search window, the best sample most accurately representing said particular event within said search window;

(b) locating other samples around the best sample in said search window including a first adjacent sample on one side of the best sample and a second adjacent sample on the other side of the best sample;

(c) selecting either said first adjacent sample or said second adjacent sample,

(d) performing a bisection operation and an amplitude determination operation between the best sample and the adjacent sample selected during the selecting step (c) to thereby determine and locate said particular event of said plurality of events in said particular seismic trace among said plurality of seismic traces.

6,016,288

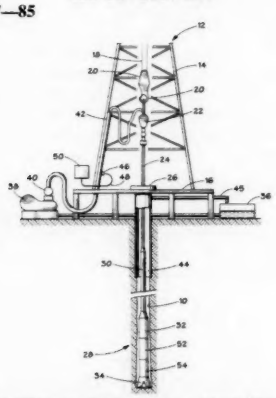
SERVO-DRIVEN MUD PULSER

Terrence G. Frith, Lafayette, La., assignor to Thomas Tools, Inc., New Iberia, La.

Continuation-in-part of application No. 08/349,188, Dec. 5, 1994, abandoned. This application Jul. 25, 1996, Appl. No. 687,207.

Int. Cl.[7] **G01V** *1/40*

U.S. Cl. 367—85 **34 Claims**



1. A pulser apparatus responsive to a signal from a downhole sensor for creating a positive pressure pulse in a column of drilling fluid being circulated through a drill string to a drill bit, said apparatus comprising:

a wire-line retrievable assembly adapted to be received within the bore of the drill string;

seating means on the retrievable assembly for seating the assembly in the lower portion of the drill string, above the drill bit, in a position substantially blocking the flow of drilling fluid around said assembly, so that a major portion of the drilling fluid which flows to said drill bit will flow through an annulus between said assembly and said drill string and through a fluid passageway in said assembly, before being supplied to said drill bit;

a main bore in the assembly having an inlet and outlet through which a major portion of the drilling fluid which flows to said bit may flow, said inlet for said main bore being in communication with said annulus and the outlet of said main bore being in communication with said drill string below said assembly;

main valve means in said assembly for selectively restricting the flow of drilling fluid through said main bore, said main valve means comprising,

orifice means defining a main orifice in said main bore,

a valve tip in said main bore above said main orifice and adjustable toward and away from said main orifice to adjust the amount of drilling fluid flowing through said main bore;

a main valve spring for urging said main valve tip toward said main orifice,

a main valve piston connected to said main valve tip by a main valve stem,

a cylinder in surrounding relationship to said main valve piston and comprising an upper chamber above said main valve piston and a lower chamber below said main valve piston;

a first fluid passageway in said assembly having an inlet in communication with said main bore and an outlet in communication with said upper cylinder chamber for supplying drilling fluid at a pressure substantially equal to the pressure in said main bore below said main valve tip to said upper cylinder chamber;

a second fluid passageway in said assembly having an inlet in communication with said annulus and an outlet in communication with said upper cylinder chamber for supplying drilling fluid at a pressure substantially equal to that of the drilling fluid in said annulus to said upper cylinder chamber;

pilot valve means in said assembly for selectively closing said second fluid passageway responsive to a signal from said sensor; and

a third fluid passageway having an inlet in communication with said annulus and an outlet in communication with said lower cylinder chamber for supplying drilling fluid at a pressure substantially equal to the pressure in said annulus to said lower cylinder chamber;

said main bore, said inlet to said main bore, said main valve tip and said orifice means being so configured, and said main valve tip being adapted to be so positioned with respect to said orifice means, when said main valve means is open, that the flow of drilling fluid through said inlet to said main bore, around said main valve tip and through said orifice means produces a first fluid pressure in said main bore at said inlet to said first fluid passageway, which first fluid pressure is lower than the annulus fluid pressure at said inlets to said second and third fluid passageways,

whereby, when said pilot valve is closed, said first fluid pressure will be communicated through said first fluid passageway to the said upper chamber of said cylinder while said higher annulus fluid pressure will be communicated through said third fluid passageway to said lower cylinder chamber, creating a pressure differential across the main valve piston which is sufficient to overcome the closing effect of said main valve spring, so as to retain said main valve open and, when said pilot valve is opened responsive to said signal, said annulus fluid pressure will be transmitted through said second fluid passageway to said upper cylinder chamber, reducing the pressure differential across said main valve piston sufficiently to permit said main valve spring to cause said main valve tip to move toward said main orifice, so as to reduce the flow of drilling fluid through said main bore and create a positive pressure pulse in said drilling fluid in said drill string above said assembly.

6,016,289

GENERATOR DRIVING DEVICE FOR AN INSTRUMENT OF SMALL VOLUME

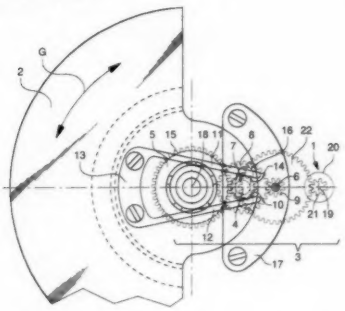
Laurent Kaelin, Sonvilier, Switzerland, assignor to Eta Sa Fabriques D'Ebauches, Grenchen, Switzerland

Filed Nov. 6, 1998, Appl. No. 187,411

Claims priority, application Switzerland, Nov. 20, 1997, 2684/97

Int. Cl.[7] G04B *1/00*; G04C *3/00*

U.S. Cl. 368—203 **7 Claims**



1. A driving device for a power generator for powering an instrument of small volume, said device including a gear train driving said generator from an oscillating weight moved by gravity, said train including a plurality of wheels and pinions arranged in a chain, wherein the chain includes a sliding wheel and pinion arranged to disengage from at least one of the other wheel and pinions and thus to interrupt said chain when the oscillating weight is subjected to an acceleration substantially exceeding that occurring during normal use of said instrument.

6,016,290

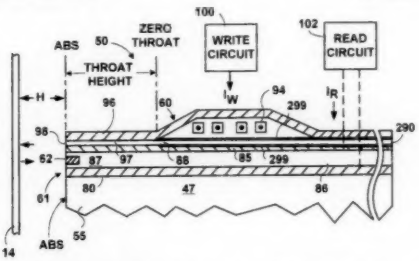
READ/WRITE HEAD WITH SHIFTED WAVEGUIDE

Hong Chen, San Jose; Ross W Stovall, Fremont, and Carl Carlson, Pleasanton, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed Feb. 12, 1999, Appl. No. 248,766

Int. Cl.[7] G11B *11/00*; *5/39*

U.S. Cl. 369—13 **27 Claims**



1. A read/write element that enables transduction of data on a data storage medium, comprising:

a thermally assisted inductive write section that writes data on the data storage medium; and

a magnetic read section that reads data from the data storage medium;

said write section including an optical waveguide core formed between a first write pole and a second write pole to conduct a light beam for heating a target on the data storage medium;

said second write pole and said optical waveguide core being offset relative to each other within a pole tip region and defining an overlap region;

said overlap region defining a written track width;

wherein said read section includes a magneto-resistive element;

wherein one edge of said second write pole is substantially aligned with a first edge of said magneto-resistive element of said read section; and

wherein one edge of said optical waveguide core is substantially aligned with a second edge of said magneto-resistive element such that said overlap area of said second write pole layer and said optical waveguide core is substantially aligned with said magneto-resistive element of said read section.

6,016,291

DATA CARRIER ARCHIVING SYSTEM

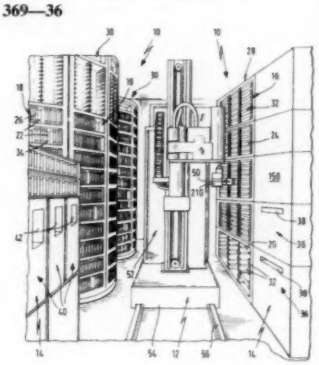
Karl-Heinz Joos, Gerstetten, Germany, assignor to Grau GmbH & Co. Holdinggessellschaft, Germany

Continuation of application No. 08/341,572, filed as application No. PCT/EP94/00925, Mar. 23, 1993, abandoned. This application Oct. 20, 1997, Appl. No. 954,403.

Claims priority, application Germany, Mar. 23, 1993, 43 09 250

Int. Cl.[7] G11B *17/22*

U.S. Cl. 369—36 **35 Claims**



1. Archiving system for data carriers comprising a storage facility having storage locations for data carriers which includes:

a first storage unit for storing a first type of data carrier cassettes, and a second storage unit for storing a second type of data carrier cassettes, said first and second types of data carrier cassettes having a different thickness for gripping,

a read/write facility having a receiver for the data carrier cassettes, said read-write facility including a first read/write unit for the first type of data carrier cassettes, and a second read/write unit for the second type of data carrier cassettes, and

a handling device for transporting data carrier cassettes from the storage locations to the receiver and vice versa, wherein

said handling device includes a gripper for the data carrier cassettes, said gripper having gripper fingers adapted such that, with the same gripper fingers, both the first type as well as the second type of data carrier cassettes are transportable from their storage locations in the respective storage units to the receiver of the respective first and second read/write unites and vice versa, and wherein

said gripper fingers define therebetween a space which is adaptable to the thickness of the respective type of data carrier cassette prior to a gripping movement of said gripper fingers for gripping the respective data cassette in the storage facility.

6,016,292

OPTICAL PICK-UP APPARATUS

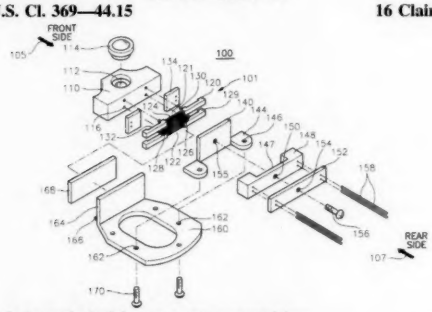
Kwang-Suk Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 27, 1998, Appl. No. 31,709

Claims priority, application Rep. of Korea, Feb. 28, 1997, 97-6528; Feb. 28, 1997, 97-6529

Int. Cl.[7] G11B *7/12*

U.S. Cl. 369—44.15 **16 Claims**



1. An optical pick-up apparatus comprising:

a base plate provided at one end thereof with a support plate which is upwardly protruded;

a permanent magnet attached to a front surface of the support plate;

a gel holder fixed to an upper surface of the base plate;

a suspension PCB attached to a rear surface of the gel holder;

a bobbin installed in a front of the permanent magnet by a predetermined distance apart from the permanent magnet;

a focusing coil and a tracking coil which are wound around the bobbin in perpendicular to each other;

a pair of coil PCBs which are attached to a front surface of the bobbin and to which the focusing and tracking coils are connected;

an object lens holder having an object lens installed thereon, the object lens holder being attached to front surfaces of the pair of the coil PCBs; and

two pairs of suspension wires for suspending the object lens holder in such a manner that the object lens holder is movable in a focusing direction or a tracking direction, each pair of suspension wires extending from the suspension PCB and being respectively connected to rear surfaces of the pair of the coil PCBs through the gel holder.

6,016,293

METHOD OF DISCRIMINATING DISCS HAVING DIFFERENT THICKNESS AND OPTICAL PICKUP DEVICE ADOPTING THE SAME

Chul-woo Lee, Seoul; Chong-sam Chung, Seongnam, and Jang-hoon Yoo, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co. Ltd., Suwon, Rep. of Korea

Filed Feb. 11, 1997, Appl. No. 797,697

Claims priority, application Rep. of Korea, Feb. 14, 1996, 96-3606

Int. Cl.[7] G11B *7/00*

U.S. Cl. 369—44.25 **44 Claims**

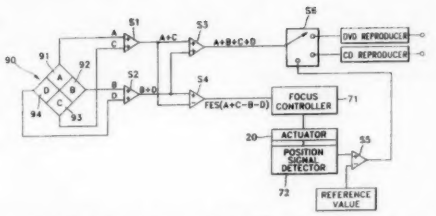
1. A method of discriminating discs having different thicknesses, comprising the steps of:

increasing and decreasing a focus voltage applied to an actuator of an objective lens facing a disc having an information-recorded plane, to move said objective lens in a standby state at a neutral position to a focus position corresponding to the disc;

detecting a movement distance value of said objective lens from a focus signal applied to said actuator when said objective lens moves to said focus position;

comparing said movement distance value with a reference value and determining the disc to be a first disc having a first thickness if said movement distance value is greater than said reference value; and

determining the disc to be a second disc having a second thickness less than the first thickness if said movement distance value is less than said reference value.



6,016,294

AGC CIRCUIT WITH A DIGITAL DIVIDER FOR AN OPTICAL DISC DRIVE UNIT

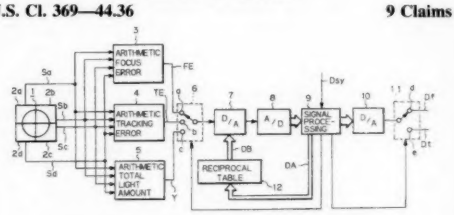
Junichi Horigome, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1993, Appl. No. 48,117

Claims priority, application Japan, Apr. 16, 1992, 4-122635

Int. Cl.[7] G11B *7/095*

U.S. Cl. 369—44.36 **9 Claims**



1. An AGC circuit for an optical disc drive including means for generating a tracking and focusing error signal by utilizing an output signal supplied from an optical pickup detector, and an actuator for correcting an error, which is driven by a servo drive signal generated by a normalized error signal, the AGC circuit comprising:

detecting means for determining an amount of light reflected from an optical disc and outputting a total light amount signal corresponding to the amount of reflected light;

table means for generating reciprocal data which is a reciprocal of the total light amount signal output from said detecting means; and

a D/A converter to which said tracking and focusing error signal is supplied as its reference signal, and said reciprocal data is supplied as its digital input, with the D/A converter outputting the normalized error signal.

6,016,295

AUDIO SYSTEM WHICH NOT ONLY ENABLES THE APPLICATION OF THE SURROUND SYTEM STANDARD TO SPECIAL PLAYBACK USES BUT ALSO EASILY MAINTAINS COMPATIBILITY WITH A SURROUND SYSTEM

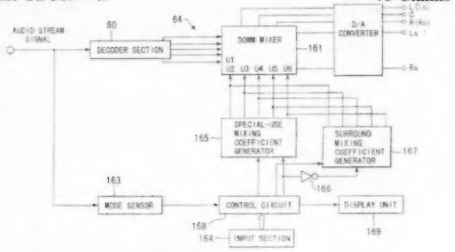
Kenjiro Endoh, Tokyo, Japan, and Craig Campbell Todd, San Fransico, Calif., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 08/910,255, Aug. 13, 1997, Pat. No. 5,896,358, which is a continuation of application No. 08/688,762, Jul. 31, 1996, abandoned. This application Feb. 10, 1999, Appl. No. 247,618.

Claims priority, application Japan, Aug. 2, 1995, 7-197797

Int. Cl.[7] G11B *7/00*

U.S. Cl. 369—49 **75 Claims**



1. An audio system comprising:

transmission means for transmitting a karaoke audio signal, the karaoke audio signal including a karaoke identifier, an accompaniment signal and at least one of a first type of sub-audio signal that is used at normal times and a second type of sub-audio signal that is used at special times, wherein a format of the karaoke audio signal includes:

the accompaniment signal assigned to a first channel, the first channel corresponding to a main audio channel under a surround audio format,

the first type of sub-audio signal assigned to a second channel, the second channel corresponding to a center audio channel under the surround audio format, and

the second type of sub-audio signal assigned to a third channel, the third channel corresponding to a surround channel under the surround audio format;

detecting means for detecting the karaoke identifier, and for setting the system in a karaoke mode when the karaoke identifier is detected;

reproducing means, operating in the karaoke mode, for reproducing:

the accompaniment signal from the first channel,

the first type of sub-audio signal, if present, from the second channel, and

the second type of sub-audio signal, if present, from the third channel;

mixing means for outputting an output signal including a mixing of at least one of the accompaniment signal, the first type of sub-audio signal, and the second type of sub-audio signal, wherein, during the normal times, the output signal includes the first type of sub-audio signal if the first type of sub-audio signal is present; and

setting means, operating in response to an external input during the special times, for setting the mixing means so that the output signal does not include the first type of sub-audio signal even if the first type of sub-audio signal is present, or the output signal includes the second type of sub-audio signal if the second type of sub-audio signal is present.

6,016,296

METHOD FOR ADJUSTING REPRODUCTION SPEED OF CD-ROM DRIVE AND DEVICE SUITABLE THEREFOR

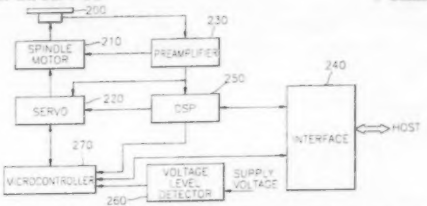
Hong-jang Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd, Rep. of Korea

Filed Jul. 16, 1997, Appl. No. 892,958

Claims priority, application Rep. of Korea, Jul. 25, 1996, 96-30460

Int. Cl.[7] G11B *7/00*

U.S. Cl. 369—50 **9 Claims**



1. A method for adjusting the reproduction speed of a CD-ROM drive assembly having a terminal for receiving a supply voltage, where the reproduction speed is adjusted according to variations of the supply voltage, said method comprising the steps of:

(a) comparing a voltage level representing a voltage generated from the supply voltage with a predetermined reference voltage level representing a stored voltage; and

(b) lowering the rotating speed of a spindle motor of the CD-ROM assembly to a corresponding speed when the voltage level is lower than the predetermined reference voltage level in said step (a).

6,016,297

INFORMATION REPRODUCTION METHOD AND APPARATUS THAT MOVE LIGHT BEAM TOWARD OUTER PERIMETER OF OPTICAL DISK IN RESPONSE TO TRACKING ERROR

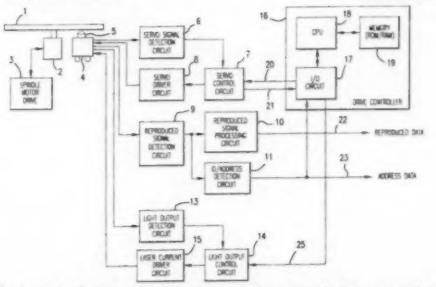
Masaya Nagasawa, Yokohama, and Masatoshi Sato, Machida, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of application No. 08/786,106, Jan. 17, 1997, abandoned. This application Feb. 18, 1999, Appl. No. 252,210.

Claims priority, application Japan, Jan. 17, 1996, 8-005570; Feb. 6, 1996, 8-019797; Jan. 17, 1997, 9-006237

Int. Cl.[7] G11B *7/095*

U.S. Cl. 369—54 **12 Claims**



1. A method of reproducing information recorded on an optical disk, the information being reproduced by projecting a beam of light onto the optical disk, a power of the beam of light during reproduction increasing as the position in the radial direction of the optical disk on which the reproduced information is recorded increases, including the steps of:

determining when it is not possible to move the beam of light so as to correctly follow the information recording tracks formed on the optical disk; and

moving the projection of the beam of light toward an outer perimeter of the optical disk without increasing the power of

the beam of light when it has been determined that it is not possible to move the beam of light so as to correctly follow the information recording tracks formed on the optical disk.

6,016,298

CALLING CARD

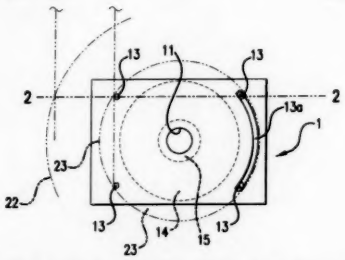
Gerhard Fischer, Emmen, Switzerland, assignor to Adivan High Tech AG, Wangen, Switzerland

Filed Mar. 27, 1998, Appl. No. 49,697

Claims priority, application Switzerland, Jun. 25, 1997, 1537/97; Mar. 5, 1998, 0526/98

Int. Cl.[7] G11B *7/02*

U.S. Cl. 369—75.1 **13 Claims**



1. A plastic calling card with an upper side printed with directly visually readable information, comprising: an underside (**12**) of the calling card having electronically processed data, which can be reproduced one of optically and acoustically by a CD drive, and the plastic calling card having means for receiving the plastic calling card in a centered position in a CD drive (**2**).

6,016,299

DISK LOADING MECHANISM FOR DISK REPRODUCING APPARATUS

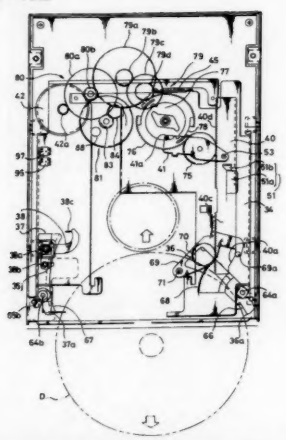
Kiyoshi Ishige, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 25, 1997, Appl. No. 900,590

Claims priority, application Japan, Jul. 26, 1996, 8-198208

Int. Cl.[7] G11B *33/02*

U.S. Cl. 369—75.2 **5 Claims**



1. A disk reproducing apparatus for reproducing at least information recorded on an information recording surface of a disk-like recording medium, comprising:

a pair of disk holders each having a groove for holding a periphery portion of a disk-like recording medium;

a first biasing means for supporting said pair of disk holders so as to be movable in a direction crossing an insertion direction of said disk-like recording medium and biasing said pair of disk holders in such a direction as to make said pair of disk holders approach each other;

second biasing means for biasing said pair of disk holders in such a direction as to make said pair of disk holders leave said disk-like recording medium;

loading means, responsive to insertion start of said disk-like recording medium, for carrying said disk-like recording medium held by said pair of disk holders to a disk chucking position;

said loading means comprises a loading motor, and a gear mechanism rotated by a rotation torque of said loading motor so as to move and actuate said pair of disk holders, and wherein said gear mechanism actuates said pair of disk holders so as to cause said disk-like recording medium to be gripped by said pair of disk holders and cause the gripped disk-like recording medium to be released;

an epicyclic gear mechanism that includes a sun gear and a planet gear engaging with said sun gear and revolving around said sun gear as a center;

said epicyclic gear mechanism comprises a working member rotated integrally with said planet gear in response to rotation operation of said sun gear, and wherein a movement of said working member and said planet gear along an outer periphery of said sun gear causes said disk-like recording medium to be gripped by said pair of disk holders and released from gripping thereby; and

a first support member and a second support member respectively for holding said pair of disk holders, wherein said first support member comprises a rack portion engaging with said planet gear, and said second support member comprises a guide portion to which said working member comes into contact so as to be slidable.

6,016,300

OPTICAL PICKUP HEAD APPARATUS

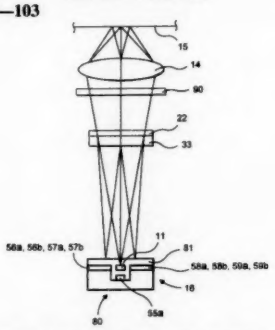
Tadashi Takeda; Yoshio Hayashi, both of Nagano; Hideo Takezoe, Tokyo, and Ken Ishikawa, Nagano, all of Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Nagano-ken, Japan

Division of application No. 08/665,764, Jun. 19, 1996, Pat. No. 5,828,643. This application Jul. 13, 1998, Appl. No. 114,602.

Claims priority, application Japan, Jun. 20, 1995, 7-176666; Jun. 20, 1995, 7-176667

Int. Cl.[7] G11B *7/00*

U.S. Cl. 369—103 **11 Claims**



5. In an optical pickup head apparatus for reading information signals from a recording medium having a laser beam light source, an objective lens and a photodetector, the improvement comprising:

a holographic optical element constructed of a pair of diffraction gratings having different diffractive conditions wherein the element is split into two by a split line near its optical axis as a border; and

a diffraction generation prevention means for preventing the generation of unwanted diffracted beams reflected from a recording medium;

wherein the optical pickup head apparatus irradiates a laser beam emitted from said light source onto a recording medium via said holographic optical element and said objective lens; beams reflected from the recording medium being guided to said photodetector via said objective lens and said holographic optical element, and

wherein said pair of diffraction gratings having said different grating conditions diffract a beam from said light source into five beams to irradiate them onto said recording medium; wherein said photo detector comprises five photodetector units which detect said five beams; and wherein said five photodetector units use one photodetector unit as a data signal reproduction photodetector unit and put out a focus and tracking error signals by the remaining four photodetector units.

6,016,301

OPTICAL PICKUP DEVICE AND OPTICAL DISC REPRODUCING APPARATUS

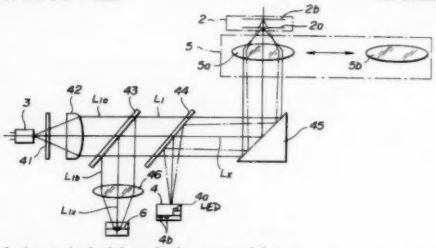
Takeharu Takasawa, Kanagawa; Hiroyuki Ito, Tokyo; Shoji Sato, Kanagawa; Hidekazu Seto, Kanagawa, and Junichi Suzuki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 27, 1997, Appl. No. 827,224

Claims priority, application Japan, Apr. 1, 1996, 8-079212; May 14, 1996, 8-145187; May 14, 1996, 8-145189

Int. Cl.[7] G11B *7/00*

U.S. Cl. 369—112 **16 Claims**



1. An optical pickup device, comprising:

a plurality of light sources for radiating a plurality of laser light beams of different wavelengths in association with a plurality of types of optical recording mediums of different layered structures;

a plurality of objective lenses for converging the laser light beams radiated from said light sources to signal recording layers of optical recording mediums;

an objective lens switching mechanism for moving one of said objective lenses to a light path between said light source and a selected one of the optical recording mediums;

a first photodetector for detecting a first reflected laser light beam having a wavelength not higher than 680 nm through a first objective lens;

a second photodetector for detecting a second reflected laser light beam having a wavelength of not lower than 770 nm through a second objective lens;

first return beam splitting means for guiding the first reflected laser light beam to the first photodetector;

second return beam splitting means for guiding the second reflected laser light beam to the second photodetector;

a concave lens between one of said plurality of light sources and one of said beam splitting means; and

optical system correction means for deviating the one objective lens arranged in said light path responsive to an output signal of one of said plurality of photodetectors, to converge the plurality of laser light beams on a signal recording layer of the selected optical recording medium, and wherein

said laser light beams radiated from said plural light sources each have plural light paths proper to the light sources and a common light path in which is positioned said one of the objective lenses.

6,016,302

OPTICAL DISC AND METHOD FOR PRODUCING SAME

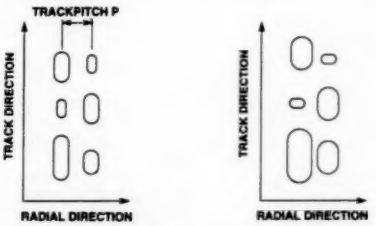
Hisayuki Yamatsu; Toshiyuki Kashiwagi, both of Tokyo; Shingo Imanishi, Kanagawa, and Shin Masuhara, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 28, 1998, Appl. No. 66,867

Claims priority, application Japan, Apr. 30, 1997, 9-113134

Int. Cl.[7] G11B *7/24*

U.S. Cl. 369—275.4 **7 Claims**



1. An optical disc having a substrate comprising a row of pits corresponding to recording signals formed thereon, a reflective film formed on the surface of the substrate carrying the row of pits, and a light-transmitting layer formed on said reflective film, in which signals recorded as said row of pits are read out from the side of the light-transmitting layer, wherein the improvement resides in that

the row of pits as referenced from the side of the light-transmitting layer includes pits whose pit length is shorter than 0.40 μm, with the ratio of the pit width of the shortest pit length to that of the longest pit length being not less than 0.8.

6,016,303

OPTICAL DISC HAVING A PROTECTIVE LAYER WHICH IS THICKER AT ITS OUTER PERIPHERY

Mikio Yoshida, and Masaki Takenouchi, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of application No. 08/908,739, Aug. 7, 1997, which is a continuation of application No. 07/994,662, Dec. 22, 1992, Pat. No. 5,916,638. This application Jan. 14, 1998, Appl. No. 7,139.

Claims priority, application Japan, Dec. 28, 1991, 3-359087; Oct. 30, 1992, 4-314331

Int. Cl.[7] G11B *5/84*

U.S. Cl. 369—283 **8 Claims**

1. A method of reducing a byte error rate of data reproduced from an optical disc arising from corrosion of a functional layer of the optical disc, comprising the steps of:

providing a substrate;

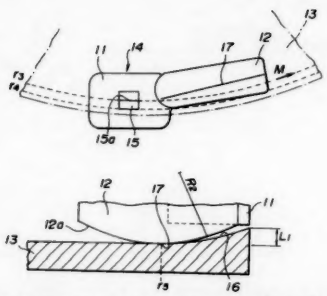
arranging a functional film over the substrate; and

forming a protective film over the functional film,

wherein the protective film has a maximum film thickness d at an outer periphery of the protective film and a mean film thickness d_0 at a flat portion of the protective film on a data area of the disc which are related by

$$2d_0 \leqq d - d_0 + 40 \text{ mm},$$

and wherein a radius of curvature of the protective film at the outer periphery of the film is equal to or greater than a radius of



curvature of a portion of a sliding contact surface of a magnetic head device radially extending toward said outer periphery of said disc from the reading portion of the magnetic head device, and wherein the radius of curvature of said protective film at said outer periphery is equal to or greater than 12.48 mm.

6,016,304

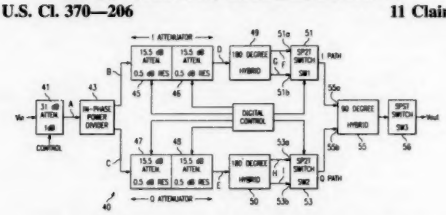
RF PHASE AND/OR AMPLITUDE CONTROL DEVICE

Robert R. Kyle, McKinney; William F. Dixon, Flower Mound, and Ronald L. Meyer, Plano, all of Tex., assignors to Raytheon Company, Lexington, Mass.

Provisional application No. 60/023,525, Aug. 7, 1996. This application Jul. 31, 1997, Appl. No. 904,144.

Int. Cl.[7] **G01R** *31/08;* **H04K** *1/02;* **H04L** *27/14*

U.S. Cl. 370—206 **11 Claims**



1. An RF control device for controlling the amplitude and phase of an RF input signal, comprising, in combination:

first power divider means for power dividing the RF input signal to provide first and second power divided signals;

amplitude control means coupled to said first power divider means for separately controlling the amplitude of said first and second power divided signals;

second power divider means coupled to said amplitude control means and responsive to said first power divided signal for providing third and fourth power divided signals of opposite phase;

third power divider means coupled to said amplitude control means and responsive to said second power divided signal for providing fifth and sixth power divided signals of opposite phase;

switch means coupled to said second and third power divider means for selectively providing one of said third and fourth power divided signals at a first switch output and one of said fifth and sixth power divided signals at a second switch output;

quadrature combiner means coupled to said first and second switch outputs for combining signals from said first and second switch outputs at phase quadrature to obtain an output signal, whereby the amplitude and phase of the output signal are dependent on the selective position of the switch means and the relative amplitudes of the third, fourth, fifth and sixth power divided signals; and

digital control means for effecting open loop control of said amplitude control means and said switch means in response to a desired amplitude and phase control for the input signal, by supplying to said amplitude control means and said switch means predetermined digital control information which corresponds to the desired amplitude and phase control for the input signal.

6,016,305

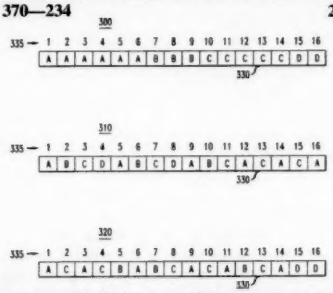
APPARATUS AND METHOD FOR TEMPLATE-BASED SCHEDULING PROCESSES USING REGULARITY MEASURE LOWER BOUNDS

Simon C. Borst, North Plainfield, and Kajamalai Gopalaswamy Ramakrishnan, Berkeley Heights, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 27, 1997, Appl. No. 835,047

Int. Cl.[7] **G01R** *31/08;* **G06F** *11/00;* **G08C** *15/00*

U.S. Cl. 370—234 **28 Claims**



1. A method for identifying a scheduling template for a network, said template having a plurality of slots assigned to corresponding signal classes, wherein an ordering of said slots indicates a repetitive scheduling order for events on said network, said method comprising:

a) assigning at least two slot positions to a particular signal class to form an intermediate template;

b) determining a lower bound of a regularity measure for said intermediate template;

c) assigning at least one additional slot of the intermediate template to a signal class of the remaining respective signal classes to be assigned, if said determined regularity measure lower bound is more advantageous than a threshold regularity measure;

d) repeating steps b) and c) until all slots are assigned in the intermediate template to provide a candidate scheduling template; and

e) determining a regularity measure of said candidate template and if it is more advantageous than a threshold regularity measure, using said candidate template for said network.

6,016,306

ROUTING BANDWIDTH-RESERVED CONNECTIONS IN INFORMATION NETWORKS

Jean-Yves Le Boudec, Jouxtens-Mezery, Switzerland; Antoni B. Przygienda, Bethesda, Md., and Robert Sultan, Katonah, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/EP93/03683, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO95/18498, PCT Pub. Date Jul. 6, 1995

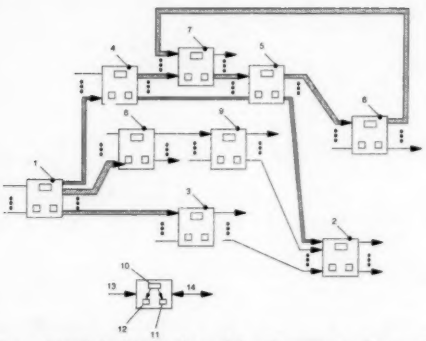
PCT Filed Dec. 24, 1993, Appl. No. 666,377

Int. Cl.[7] **G06F** *13/00;* **H04L** *12/56*

U.S. Cl. 370—235 **4 Claims**

1. For use at a node in a network having a plurality of nodes interconnected by links, each of the links having an assigned link weight reflecting a selected link characteristic, a method of selecting a least weight path from a source to a destination comprising the steps of:

constructing a set of loop-free paths from the source to the destination;



for each path in the set, determining the amount of currently-available bandwidth on each link in the path;

for each path in the set, assigning a path weight as a function of the minimum amount of bandwidth currently available anywhere along the path;

establishing a subset of paths including each path having a path weight equal to the lowest assigned path weight; and

selecting a final path from the established subset of paths.

6,016,307

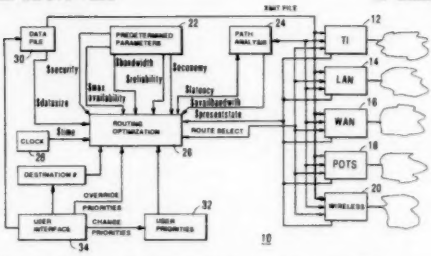
MULTI-PROTOCOL TELECOMMUNICATIONS ROUTING OPTIMIZATION

Allen D. Kaplan, Miami Beach, Fla., and William F. McCarthy, Erie, Pa., assignors to Connect One, Inc., Miami Beach, Fla.

Filed Oct. 31, 1996, Appl. No. 741,130

Int. Cl.[7] H04L *12/56*

U.S. Cl. 370—238 **27 Claims**



14. A telecommunications switching system comprising:

a) a first memory for holding a data file to be transferred to a remote destination, said data file having at least one associated property;

b) a plurality of interfaces coupled with said first memory, each of said interfaces interconnected with an associated telecommunications path capable of transferring the data file with the remote destination;

b) a second memory for storing predetermined parameters associated with each of said telecommunications paths;

c) means for measuring the value of a variable parameter associated with each of said telecommunications paths; and

d) processor means operatively associated with said first and second memories and said variable parameter measuring means for determining which of said plurality of telecommunications paths should be utilized for transferring the data file in accordance with said data file property, said predetermined telecommunications path parameters, and said measured variable parameters.

6,016,308

METHOD AND SYSTEM FOR INCREASING NETWORK INFORMATION CARRIED IN A DATA PACKET VIA PACKET TAGGING

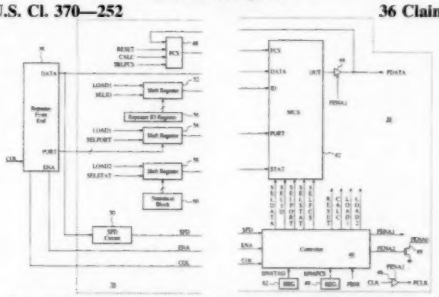
Ian S. Crayford, San Jose, and William Lo, Santa Clara, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of application No. 08/406,085, Mar. 17, 1995, Pat. No. 5,550,803. This application Aug. 15, 1996, Appl. No. 698,185.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04J *3/14*

U.S. Cl. 370—252 **36 Claims**



1. A method for providing statistical network information carried in a data packet, the method comprising the steps of:

(a) receiving a data packet on a repeater in the network, the data packet having a data portion;

(b) transferring the data portion of the data packet to a management unit;

(c) appending statistical information to the data packet transmitted to the management unit during an inter-packet gap period, the statistical information including identification of a repeater port from which a data packet has been received as well as identification of a repeater circuit receiving the data packet; and

(d) providing a control signal indicative of network activity during the step of appending.

6,016,309

APPARATUS FOR AN AUTOMATIC SPEED AND DATA LENGTH SELECTION OF AN ASYCHRONOUS DATA LINK

Alain Benayoun, Cagnes/Mer; Jean-Francois Le Pennec, Nice, and Patrick Michel, La Gaude, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1996, Appl. No. 751,800

Claims priority, application European Pat. Off., Nov. 21, 1995, 95480169

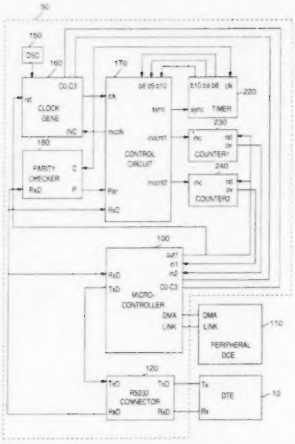
Int. Cl.[7] H04J *3/14*

U.S. Cl. 370—252 **6 Claims**

1. An asynchronous interface apparatus comprising a microcontroller connected to an asynchronous device through an asynchronous data link and including an adapter for automatically adapting an asynchronous communication data flow between said microcontroller and the asynchronous device, said adapter including logical circuitry for receiving an input signal from said asynchronous device, for analyzing the input signal to automatically identify configuration parameters of the asynchronous data link, and for providing the identified configuration parameters to said microcontroller for adapting communication with the asynchronous device said logical circuitry having at least one control system for monitoring the input signal received from the asynchronous device to detect a number of data bits, a parity type and a number of stop bits per data character in the asynchronous communication data flow, each said control system including:

a control circuit receiving the input signal;

a clock generator for providing a clock signal to said control circuit and for varying the frequency of said clock signal



responsive to a signal from said control circuit to enable said control circuit to detect a transmission speed on the asynchronous data link;

a timer circuit controlled by said control circuit for synchronizing bit counting of the communication data flow so as to identify the number of data bits per character;

a parity checker for calculating the parity of the data bits, the calculated parity being transmitted to said control circuit to validate a parity type; and

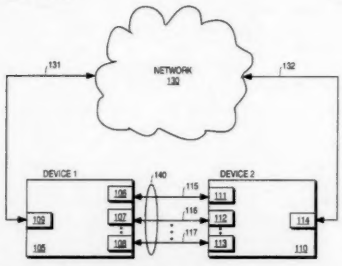
a plurality of counters driven by said control circuit for counting the number of times an identified configuration of parameters containing one or two stop bits is detected so as to validate an identified configuration and to generate a valid configuration signal for delivery to said microcontroller indicating that a valid configuration has been detected by said logical circuitry.

6,016,310

TRUNKING SUPPORT IN A HIGH PERFORMANCE NETWORK DEVICE

Shimon Muller, Sunnyvale, and Ariel Hendel, Cupertino, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jun. 30, 1997, Appl. No. 885,233
Int. Cl.[7] **H04L** *12/28;12/56*
U.S. Cl. 370—255 **33 Claims**



1. A network device comprising:

a plurality of ports including a first port configured to receive a packet, at least the first port configured to be associated with at wherein the trunk is a logical channel between the network device and another network device that includes two or more physical network links;

a memory for storing a forwarding database, the forwarding database including a plurality of entries containing therein forwarding information for a subset of addresses; and

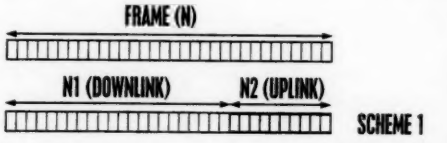
a learning circuit coupled to the first port and the memory configured to modify the forwarding database to reflect an association between the first port and a first address contained within the packet, the learning circuit updating the forwarding database based upon a trunk designator corresponding to the trunk if the trunk is of a first type, the learning circuit updating the forwarding database based upon a port designator corresponding to the first port if the trunk is of a second type, wherein ports associated with trunks of the first type each have the same media access control (MAC) address, and ports associated with trunks of the second type each have a different MAC address.

6,016,311

ADAPTIVE TIME DIVISION DUPLEXING METHOD AND APPARATUS FOR DYNAMIC BANDWIDTH ALLOCATION WITHIN A WIRELESS COMMUNICATION SYSTEM

Sheldon L. Gilbert; Rami Hadar, and Israel J. Klein, all of San Diego, Calif., assignors to Ensemble Communications, Inc., San Diego, Calif.

Filed Nov. 19, 1997, Appl. No. 974,376
Int. Cl.[7] **H04Q** *7/20*
U.S. Cl. 370—280 **45 Claims**



1. A method for adaptively duplexing transmissions in a communication link using a time division duplexing scheme wherein transmissions are communicated in an uplink direction during uplink time slots and wherein transmissions are communicated in a downlink direction during downlink time slots, comprising the steps of:

(a) determining an uplink bandwidth requirement and a downlink bandwidth requirement of the communication link, wherein the uplink and downlink bandwidth requirements are determined using associated and respective uplink and downlink bandwidth utilization parameters reflective of a statistical average bandwidth utilization in the communication link, and wherein the bandwidth utilization parameters are calculated by monitoring bandwidth utilization in the communication link over a pre-determined period of time;

(b) calculating an uplink/downlink bandwidth requirement ratio based upon the uplink and downlink bandwidth requirements of the link;

(c) allocating uplink and downlink time slots in response to the calculated uplink/downlink bandwidth ratio; and

(d) periodically enabling uplink transmissions during the allocated uplink time slots and downlink transmissions during the allocated downlink time slots.

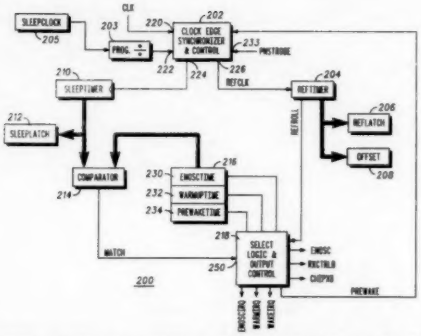
6,016,312

RADIOTELEPHONE AND METHOD FOR CLOCK CALIBRATION FOR SLOTTED PAGING MODE IN A CDMA RADIOTELEPHONE SYSTEM

Brian D. Storm, Round Lake Beach; Mark J. Callicotte, Oak Park, and Stephen V. Cahill, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of application No. 08/808,275, Feb. 28, 1997. This application Feb. 28, 1997, Appl. No. 808,275.
Int. Cl.[7] **G08C** *17/00;* **H04B** *7/216*
U.S. Cl. 370—311 **17 Claims**

11. A radiotelephone configured for operation in a code division multiple access (CDMA) radiotelephone system including a plural-



ity of base stations, transmitting a short pseudorandom noise (PN) sequence including a system timing indicator comprising a PN roll boundary of the short PN sequence, the radiotelephone comprising:

a PN code generator providing a short PN sequence to align with the system timing indicator;

a reference oscillator for generating a reference clock signal synchronized to the system timing indicator using the short PN sequence from the PN code generator at a first rate;

a sleep clock generator for generating a sleep clock signal;

a reference timer for counting periods of the reference clock signal;

a sleep timer for counting periods of the sleep clock signal;

a controller for determining timing accuracy of the sleep clock generator by relating the periods of the sleep clock signal to the periods of the reference clock signal, the controller determining an offset between the reference clock signal and the sleep clock signal; and

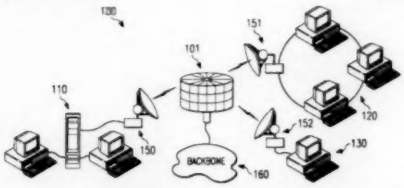
a sleep time controller for placing the radiotelephone in a low power sleep mode having a duration based on the timing accuracy of the sleep clock generator, the sleep time controller adjusting the duration by combining timing of the sleep clock signal and the offset.

6,016,313

SYSTEM AND METHOD FOR BROADBAND MILLIMETER WAVE DATA COMMUNICATION

Robert B. Foster, Jr.; Charles R. Baugh, and David C. Schafer, all of Bellevue, Wash., assignors to WAVTrace, Inc., Bellevue, Wash.

Filed Nov. 7, 1996, Appl. No. 740,332
Int. Cl.[7] H04J *4/00*
U.S. Cl. 370—330 **86 Claims**



1. A system for providing broadband information communication between a plurality of locations, said system comprising:

a plurality of nodes, each node having associated therewith at least one node antenna adapted for broadband communication in a frequency band of the millimeter wave spectrum of frequencies, said at least one node antenna having a predetermined communication beam to provide directional communication, said plurality of nodes comprising:

a first node of said plurality of nodes adapted to communicate via at least a first frequency band of the millimeter wave spectrum of frequencies; and

a second node of said plurality of nodes adapted to communicate via at least a second frequency band of the millimeter wave spectrum of frequencies; and

a processor-based communication hub comprising:

a plurality of hub antennas, each hub antenna having a predetermined communication beam to provide directional communication;

a first hub antenna of said plurality of antennas adapted to communicate with said first node via said first frequency band of the millimeter wave spectrum of frequencies; and

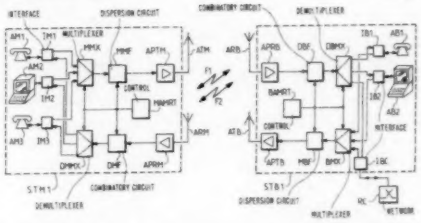
a second hub antenna of said plurality of antennas adapted to communicate with said second node via said second frequency band of the millimeter wave spectrum of frequencies.

6,016,314

INFORMATION TRANSMISSION SYSTEM COMPRISING AT LEAST ONE BASE STATION AND AT LEAST ONE SATELLITE STATION

Yvon Guedes, Lannion, and Rémi Sfez, Saint Cloud, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of application No. 07/857,348, Mar. 25, 1992, abandoned. This application Oct. 12, 1993, Appl. No. 135,370. Claims priority, application France, Apr. 2, 1991, 9103949
Int. Cl.[7] H04B *7/22*
U.S. Cl. 370—337 **16 Claims**



1. An information transmission system, comprising a plurality of stations, said stations being arranged to exchange information signals by transmitting a plurality of time multiplexed signals over a plurality of channels having different carrier frequencies, wherein one of said stations comprises:

means for encoding a first of said information signals with an error correction code, to form a first encoded sample,

means for interleaving parts of said first encoded sample to form a first sequence of parts,

a multiplexer for generating a succession of parcels, each parcel comprising a plurality of time slots, at least one of said time slots including a portion of said first sequence of parts, and

frequency dispersion means for distributing the information content of two successive ones of said parcels for simultaneous transmission as signals in time multiplexed slots of at least two of said channels respectively, said information content being transmitted once only; and

another of said stations comprises a receiver comprising:

means for receiving and demultiplexing said signals in said time multiplexed slots of said at least two of said channels, and

means for providing a replica of said first of said information signals based on the received signals,

whereby, in said receiver, correction of burst errors affecting the content of one channel is simplified without need for redundant transmission.

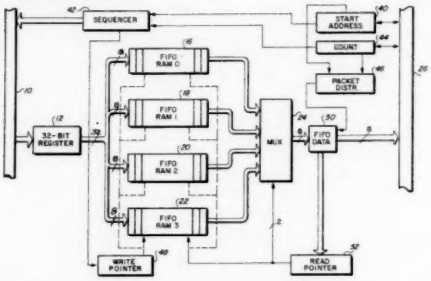
6,016,315
VIRTUAL CONTIGUOUS FIFO FOR COMBINING MULTIPLE DATA PACKETS INTO A SINGLE CONTIGUOUS STREAM

Peter Chambers, and Scott E. Harrow, both of Scottsdale, Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 30, 1997, Appl. No. 846,294

Int. Cl.[7] **H04L** *12/56;12/50*

U.S. Cl. 370—378 **12 Claims**



1. A system for combining multiple arbitrarily sized and aligned data packets into a single contiguous byte stream including in combination:

a source of packets of digital data which are of arbitrary different byte sizes;

a plurality of FIFO RAM memory units coupled in parallel to said source of packets of digital data;

a read pointer coupled with said RAM memory units for controlling the reading of data therefrom to produce a continuous stream of output data;

a control circuit responsive to said stream of output data and coupled with said read pointer to operate said read pointer;

a write pointer coupled with said RAM memory units for controlling the writing of data into said RAM memory units; and

a sequencer circuit coupled with and responsive to said control circuit and further coupled with said write pointer to operate said write pointer.

6,016,316
HYBRID ACCESS SYSTEM EMPLOYING PACKET SUPPRESSION SCHEME

Eduardo J. Moura, San Joe, and Jan Maksvilian Gronski, Palo Alto, both of Calif., assignors to Hybrid Networks, Inc., Cupertino, Calif.

Division of application No. 08/426,920, Apr. 21, 1995, Pat. No. 5,586,121. This application Aug. 20, 1996, Appl. No. 697,079.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H04J** *3/24*

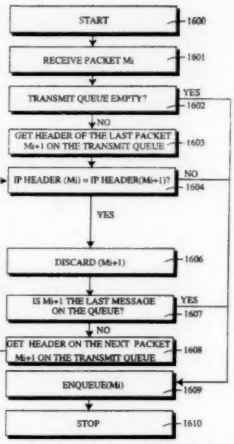
U.S. Cl. 370—389 **19 Claims**

1. A method of packet suppression for use in communication between first and second nodes having respective first and second transmit and receive queues, in which information packets having headers and content are transmitted from a first node to said second node, said method comprising:

providing a packet structure defining headers that uniquely identify the content of said information packets,

loading a transmit queue of said first node with a first information packet;

loading a second information packet into a transmit queue of said first node;



checking the headers of said first and second information packet; and

suppressing one of said first and second information packets, if the headers are the same.

6,016,317
ATM CELL SWITCHING SYSTEM

Yoshito Sakurai, Yokohama; Kenichi Ohtsuki, Hayamamachi; Shinobu Gohara, Yokohama; Makoto Mori, Yokohama; Akira Horiki, Yokohama; Takao Kato, Yokohama, and Hiroshi Kuwahara, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

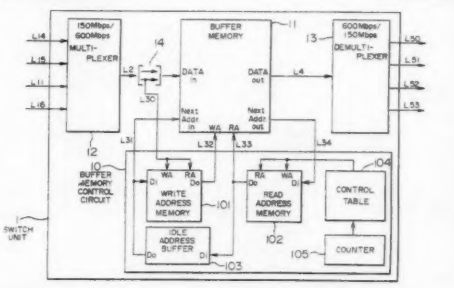
Continuation of application No. 08/306,978, Sep. 16, 1994, Pat. No. 5,799,014, which is a continuation of application No. 07/845,668, Mar. 4, 1992, Pat. No. 5,365,519, which is a continuation-in-part of application No. 07/482,090, Feb. 20, 1990, Pat. No. 5,124,977, which is a continuation-in-part of application No. 07/218,217, Jul. 13, 1988, Pat. No. 4,910,731, said application No. 07/845,668 is a continuation-in-part of application No. 07/745,466, Aug. 14, 1991, Pat. No. 5,280,475. This application Jun. 5, 1995, Appl. No. 462,269.

Claims priority, application Japan, Jul. 15, 1987, 62-174603; Oct. 9, 1987, 62-253661; Nov. 11, 1987, 62-283249; Apr. 27, 1988, 63-102512; Feb. 22, 1989, 1-040230; Aug. 17, 1990, 2-215705; Mar. 5, 1991, 3-038388

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H04L** *12/56*

U.S. Cl. 370—391 **11 Claims**



1. A switching system for switching a fixed-length cell composed of a header section and an information section between a plurality of incoming highways and a plurality of outgoing highways based on information included in the header section of said cell, comprising:

a first storage for storing cells received from said plurality of incoming highways and switching said cells to a destination outgoing highway of said plurality of outgoing highways;

a second storage which stores information corresponding to an idle address of said first storage;

a third storage which stores information from said second storage as a next address for writing a next cell in said first storage; and

a control circuit which controls write and read operations of said first storage corresponding to information stored in said second storage,

wherein said control circuit, installed in common to said first storage and said second storage, is connected so that information corresponding to an idle address of said first storage is stored in said second storage based on a read address of said first storage from said control circuit and information from said second storage is output as a write address of said first storage, and

wherein said control circuit inputs said next address as an address corresponding to a write address of said third storage at a time of writing a cell into said first storage and outputs a read address of said first storage based on said next address output from said third storage at a time of reading a cell from said first storage.

6,016,318

VIRTUAL PRIVATE NETWORK SYSTEM OVER PUBLIC MOBILE DATA NETWORK AND VIRTUAL LAN

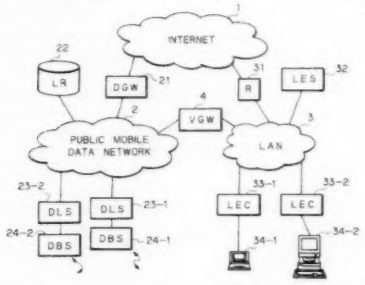
Hiroyuki Tomoike, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 14, 1997, Appl. No. 892,280

Claims priority, application Japan, Jul. 12, 1996, 8-203015

Int. Cl.[7] H04J *3/24*

U.S. Cl. 370—401 **12 Claims**



1. A virtual private network system accessed by an internet, comprising:

a virtual local area network (LAN) connected to a LAN emulation server and LAN emulation clients;

a router connected between said internet and said virtual LAN;

a public mobile data network connected to a location register and mobile data subscriber processing units;

a data gateway connected between said internet and said public mobile data network;

a virtual private network gateway connected between said virtual LAN and said public mobile data network; and

a mobile data terminal having one internet protocol (IP) address and one network address of said public mobile data network and capable of being connected to either one of said LAN emulation clients or one of said mobile data subscriber processing units,

wherein said location register storing a correspondence between said network address and one of said mobile data subscriber processing units,

wherein said virtual private network gateway comprises:

a memory for storing a correspondence between said IP address and said network address of said mobile data terminal;

a communication control section communicatively connected to said public mobile data network;

a call control section having a LAN emulation capability; and

a transmission control protocol/internet protocol (TCP/IP) interface communicatively connected to said virtual LAN.

6,016,319

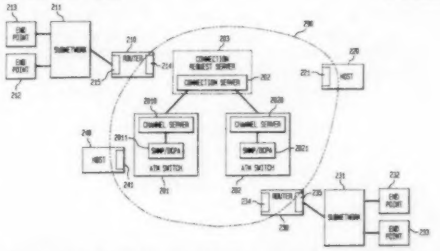
COMMUNICATIONS SYSTEM FOR TRANSMISSION OF DATAGRAM PACKETS OVER CONNECTION-ORIENTED NETWORKS

Madhukar M. Kshirsagar, Morganville, N.J.; Thomas F. La Porta, Thornwood, N.Y.; David H. Shur, Middletown, N.J.; Malathi Veeraraghavan, Atlantic Highlands, N.J., and Clark Woodworth, Rumson, N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Provisional application No. 60/007,105, Oct. 31, 1995. This application Sep. 11, 1996, Appl. No. 714,704.

Int. Cl.[7] H04L *12/28;12/56*

U.S. Cl. 370—410 **3 Claims**



1. A method of communicating connectionless datagrams between a source node and a destination node over a connection-oriented network, said method comprising the steps of:

transmitting from said source node to a connection request server coupled to said connection-oriented network a connectionless address of said destination node to signal a request to communicate with said destination node;

in response to said request received by said connection request server, establishing from said connection request server a connection-oriented virtual channel between said source node and said destination node using third-party control;

assigning a virtual channel identifier to said connection oriented virtual channel;

transmitting said virtual channel identifier from said connection request server to said source node;

segmenting said connectionless datagrams into one or more appropriate size connection-oriented cells, each of said cells including said virtual channel identifier; and

transmitting said one or more cells from said source node to said destination node on said connection-oriented virtual channel.

6,016,320

TELECOMMUNICATIONS SYSTEM

Paul Douglas Welton, Harlow, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

PCT No. PCT/GB95/01453, § 371 Date Feb. 21, 1997, § 102(e) Date Feb. 21, 1997, PCT Pub. No. WO95/35614, PCT Pub. Date Dec. 28, 1995

PCT Filed Jun. 21, 1995, Appl. No. 765,293

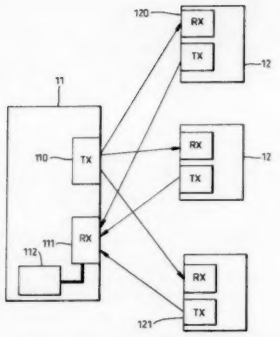
Claims priority, application United Kingdom, Jun. 22, 1994, 9412508

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04B *7/212*

U.S. Cl. 370—442 **6 Claims**

1. An arrangement for marshalling an outstation in a time division multiple access (TDMA) telecommunications system including a base station and a plurality of outstations, each said



outstation having means for transmitting a marshalling sequence continuously and in parallel with a transmitted data signal, said data signal having a first high logic level condition and a second low logic level condition, wherein the base station incorporates first detection means for detecting the marshalling signal when the corresponding data signal is in its first level condition, second detection means for detecting the marshalling signal when the data signal is in its second level condition, wherein the base station incorporates means responsive to the level condition of the data signal for selectively enabling the first or second detector means, wherein said first and second detection means comprise respective first and second comparators each of whose threshold is adjusted to the respective high or lower level condition of the data signal so as to effect detection of the marshalling signal during that data signal level condition, and wherein the high or low level condition of the data signal is determined via a third comparator whose threshold is adjusted to a level between said first and second levels.

6,016,321

METHOD FOR TRANSMITTING DIGITAL DATA IN A CONTINUOUS DATA STREAM BETWEEN TWO SUBSCRIBERS OF A NETWORK WITH A SINGLE LINE BETWEEN EACH ADJACENT SUBSCRIBER

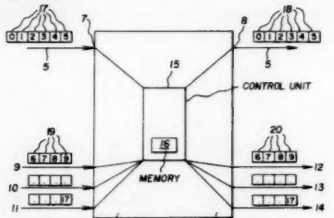
Herbert Hetzel, Weingarten; Patrick Heck, Durmersheim, and Andreas Stiegler, Karlsbad, all of Germany, assignors to Becker GmbH, Karlsbad-Ittersbach, Germany

Filed Feb. 2, 1996, Appl. No. 595,840

Claims priority, application Germany, Feb. 2, 1995, 195 03 212

Int. Cl.[7] H04J *3/02*

U.S. Cl. 370—458 **6 Claims**



1. In a method for transmitting digital data over data lines between a plurality of subscribers forming data sources and data sinks and being disposed in a network connecting the plurality of the subscribers to one another, the method for transmitting digital data includes transmitting the data in a continuous data stream synchronized to a clock signal and containing a clocked sequence of bit groups of equal length, the improvement which comprises:

subdividing the bit groups into partial bit groups each forming a data channel, for temporarily assigning each of the partial bit groups to a first subscriber and to a second subscriber out of the plurality of subscribers for a data transmission, whereby the first subscriber is a data source and the second subscriber is a data sink;

freely selecting, initiated by any one of the plurality of subscribers, at least one of the partial bit groups forming the data channels assigned to the first and second subscribers in the network from the existing data channels for a data transmission; and

allocating the partial bit groups forming the data channels according to an allocation specification specifying an allocation of each data channel to one data source and one data sink and being definable prior to the data transmission by a control command sent by one of the two subscribers.

6,016,322

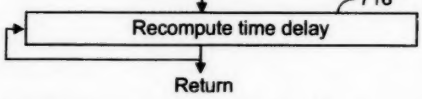
APPARATUS AND METHOD FOR SELF SYNCHRONIZATION IN A DIGITAL DATA WIRELESS COMMUNICATION SYSTEM

Herbert B. Goldman, Tustin, Calif., assignor to Kor Electronics, Inc., Garden Grove, Calif.

Filed Sep. 22, 1997, Appl. No. 934,800

Int. Cl.[7] H04B *7/212;* **H04J** *3/00;3/06*

U.S. Cl. 370—508 **19 Claims**



1. A wireless communication apparatus comprising:

a first receiver that enables communication with a universal communication system, the universal communication system comprising a Global Positioning System (GPS);

a transmitter/receiver that enables communication through a multiple channel access communication link to one or more communication units; and

a processing unit that is assigned a time slot for transmitting data through the multiple channel access communication link to a select communication unit, that receives a position of the select communication unit that is based on a position signal emitted from the universal communication system, and that advances transmissions to the select communication unit by a time that is based on the position of the select communication unit.

6,016,323

BROADLY TUNABLE SINGLE LONGITUDINAL MODE OUTPUT PRODUCED FROM MULTI-LONGITUDINAL MODE SEED SOURCE

James Kafka, Mountain View; Vincent J. Newell, Pleasanton; Michael Watts, Union City, and James Clark, Campbell, all of Calif., assignors to Spectra Physics Lasers, Inc., Mountain View, Calif.

PCT No. PCT/US95/07189, § 371 Date Oct. 21, 1996, § 102(e) Date Oct. 21, 1996, PCT Pub. No. WO96/08858, PCT Pub. Date Mar. 21, 1996

Continuation-in-part of application No. 08/305,032, filed as application No. PCT/US95/07189, Jun. 6, 1995, Pat. No. 5,577,058. This PCT application Jun. 6, 1995, Appl. No. 727,469.

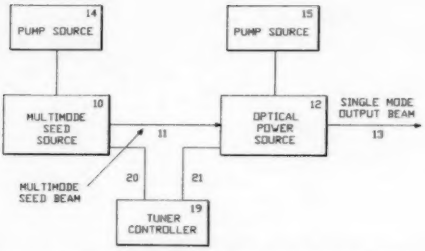
This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01S *3/10*

U.S. Cl. 372—20 **13 Claims**

1. A tunable oscillator system comprising:

a seed source capable of producing a multimode seed beam;



an optical power source coupled to the seed source and injection seeded by the multimode seed beam to generate an output beam, the optical power source having a cavity with an optical length which causes a single mode output to be produced by the optical power source; and

a tuner controller coupled to the seed source and the optical power source which controls a wavelength of the output beam by controlling the seed source and the optical power source.

6,016,324

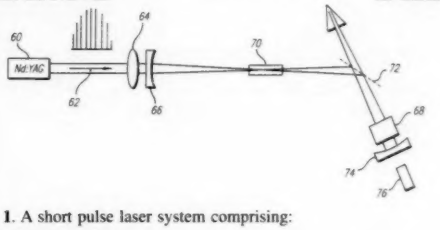
SHORT PULSE LASER SYSTEM

Harry Rieger; Henry Shields, both of San Diego, and Richard Foster, Manhattan Beach, all of Calif., assignors to JMAR Research, Inc., San Diego, Calif.

Continuation-in-part of application No. 08/725,750, Oct. 4, 1996, Pat. No. 5,742,634, which is a continuation-in-part of application No. 08/503,373, Jul. 17, 1995, abandoned, which is a continuation-in-part of application No. 08/295,283, Aug. 24, 1994, Pat. No. 5,434,875, and a continuation-in-part of application No. 08/339,755, Nov. 15, 1994, Pat. No. 5,491,707, and a continuation-in-part of application No. 08/429,589, Apr. 27, 1995, abandoned. This application Apr. 9, 1998, Appl. No. 58,274.

Int. Cl.[7] H01S *3/10*

U.S. Cl. 372—25 **23 Claims**



1. A short pulse laser system comprising:

a laser crystal;

an optical pump arranged to pump said laser crystal;

a resonator defining a beam path;

a first optical shutter installed within said resonator and blocking passage of light in said resonator except for defined periods of time, said first optical shutter defining an ON period and an OFF period;

a second optical shutter installed within said resonator blocking the passage of light in said resonator except for periodic predetermined intervals, such that during said ON period a light pulse in said resonator is able to make at least one transit through said laser crystal, whereby said periodic predetermined interval determines a pulse length under 5000 picoseconds and said light pulse increases in intensity on each transit, creating an intensified pulse; and

an optical release mechanism releasing said intensified pulse from said resonator.

6,016,325

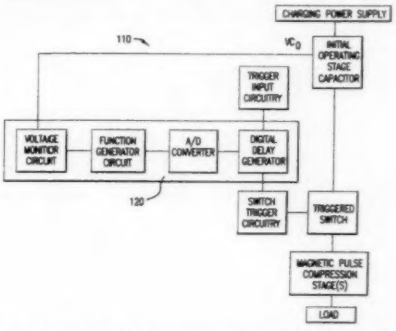
MAGNETIC MODULATOR VOLTAGE AND TEMPERATURE TIMING COMPENSATION CIRCUIT

Richard M. Ness; William N. Partlo, both of San Diego, and Richard L. Sandstrom, Encinitas, all of Calif., assignors to Cymer, Inc., San Diego, Calif.

Filed Apr. 27, 1998, Appl. No. 69,019

Int. Cl.[7] H01S *3/00*

U.S. Cl. 372—38 **11 Claims**



1. A pulse delay timing compensation circuit of a magnetic modulator of a gas discharge laser to provide timing compensation for voltage variations in an initial operating stage capacitor, said timing compensation circuit comprising:

a first monitor having a first monitor input terminal connected to a voltage probe interconnected with a terminal of said initial operating stage capacitor of said magnetic modulator and having a first monitor output terminal;

a digitizer having a digitizer input terminal interconnected with said first monitor output terminal and having a digitizer output terminal;

a function generator for generating a signal representing delay in response to a voltage signal from said first monitor, said function generator being interconnected between said first monitor output terminal and said digitizer input terminal; and

a digital timing delay generator having distinct first terminal, second terminal, and third terminal, said first terminal being connected to said digitizer output terminal, said second terminal being interconnected with a trigger input circuit, and said third terminal being interconnected with a triggered switch of said magnetic modulator;

wherein said timing circuit compensates for voltage variations in said initial operating stage capacitor to produce approximately constant delay between signals to operate said trigger switch and pulse discharges.

6,016,326

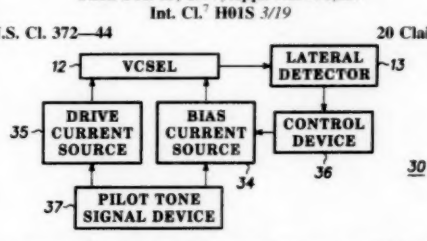
METHOD FOR BIASING SEMICONDUCTOR LASERS

Paul Robert Claisse, and Philip Anthony Kiely, both of Gilbert, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 15, 1997, Appl. No. 990,267

Int. Cl.[7] H01S *3/19*

U.S. Cl. 372—44 **20 Claims**



1. A method for biasing a semiconductor laser, comprising the steps of:

applying pilot tone signals to a bias current and a drive current of the semiconductor laser; and

monitoring spontaneous emissions of the semiconductor laser to maintain a threshold level of the semiconductor laser.

6,016,327

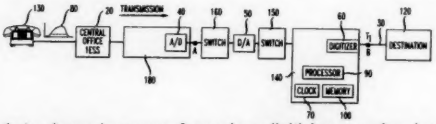
ELECTRONIC MEMORY SYSTEM AND METHOD FOR USE IN SYSTEM FOR REDUCING QUANTIZATION NOISE

Alan Edward Kaplan, Morris Township, Morris County, N.J., assignor to AT&T Corporation, New York, N.Y.

Filed Oct. 3, 1997, Appl. No. 943,156

Int. Cl.[7] H04B *14/04*

U.S. Cl. 375—243 **20 Claims**



1. An electronic memory for use in re-digitizing an analog signal reconstructed from a first digitization of an original analog signal, comprising;

an encoder, receiving the output bits of an analog-to-digital conversion of the analog signal, with the bit values of that conversion indexing a set of stored digitization data in the encoder;

a memory connected to the encoder and receiving the digitization data output from the encoder and storing the digitization data in rows representing the time period used in the first digitization of the original analog signal; and

memory logic circuitry, connected to the memory, and configured to output a valid row signal when all of the digitization data in a row of the memory satisfy predefined criteria.

6,016,328

METHOD AND APPARATUS FOR THE SYNCHRONIZATION OF A SIGNAL RECEIVING STATION

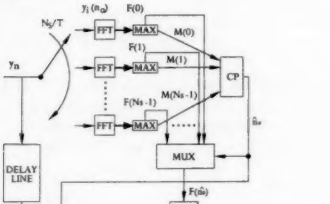
Guiseppe Caire, Turin, Italy, and Carlo Elia, Oegstgeest, Netherlands, assignors to Agence Spatiale Europeenne, Paris, France

Filed Jan. 7, 1997, Appl. No. 780,660

Claims priority, application France, Jan. 16, 1996, 96 00414

Int. Cl.[7] H04L *27/10;27/14;* **H03D** *3/00;* **G08C** *19/00*

U.S. Cl. 375—272 **8 Claims**



1. A method of synchronizing a frequency shift keying (FSK) modulated signal receiving station, comprising the steps of:

sampling the received M-FSK signal,

selecting one sample per symbol within a detection window having a finite length,

said samples being selected at predetermined instants iN_s+n_o, where N_s is the number of symbols in the received signal and n_o is the sampling epoch,

thereby to produce a number N_s of versions of the sampled signal, and

processing in parallel said N_s versions of the sampled signal to determine the signal timing and the signal frequency offset,

wherein said data processing step comprises the step of selecting the sample having the largest spectral peak.

6,016,329

METHOD AND APPARATUS FOR PREAMBLE-LESS DEMODULATION

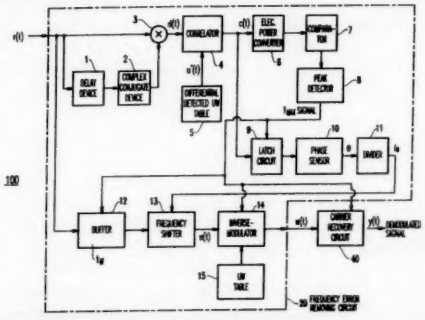
Motoya Iwasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1997, Appl. No. 919,820

Claims priority, application Japan, Sep. 27, 1996, 8-255978

Int. Cl.[7] H03D *1/00;* **H04L** *27/10;* **H04J** *3/12*

U.S. Cl. 375—340 **32 Claims**



1. A preamble-less demodulator, comprising:

a detector for detecting a differential-detected unique word portion of an input signal, said input signal comprising said unique word portion and a data portion and being devoid of a preamble;

a correlator for cross-correlating an output of said differential-detector and data in a data table obtained by said differential-detected unique word portion;

a latch for latching a signal when an electrical power of a correlation output which exceeds a threshold value becomes a local maximum;

a frequency error estimator for determining a frequency error of said unique word portion based on said latched signal; and

means for demodulating said data portion based on said differential-detected unique word portion and said frequency error.

6,016,330

ENCODING AND DETECTION OF BALANCED CODES

Jonathan James Ashley, Los Gatos, and Brian Harry Marcus, Los Altos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1996, Appl. No. 733,409

Int. Cl.[7] H04L *27/06;* **G06F** *11/00;11/10*

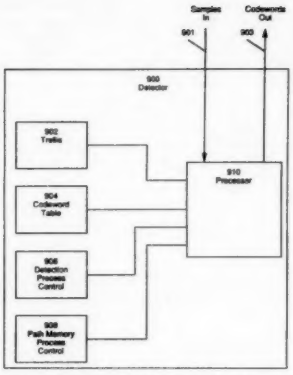
U.S. Cl. 375—341 **4 Claims**

3. An apparatus for detecting a codeword from a data stream comprising a series of sequences of samples representing intensities of an analog signal, comprising:

a codeword table container, containing a representation of a set of codewords comprising a block encoded balanced code represented by a trellis;

a trellis container, containing a representation of the trellis shown in FIG. **11**; and

a processing apparatus receiving a sequence of samples for which ideal intensity values are not known and selecting a codeword having the greatest correlation with the sequence of samples by iteratively determining correlations and code-



words for each state at each level of the trellis based on the correlations at the preceding level of the trellis.

6,016,331

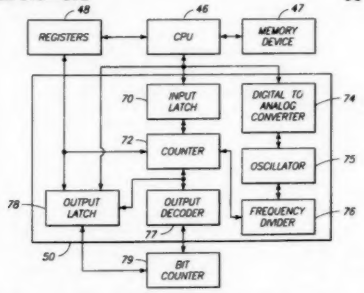
METHODS OF SYNCHRONIZATION, PERSONAL HANDY-PHONE SYSTEM STATIONS AND PHASE LOCK LOOPS

Denis Archambaud, Antibes; Patrick Feyfant, Toulon; Philippe Gaglione, Mandelieu; Varenka Martin, Antibes; Oliver Weigelt, Antibes; Laurent Winckel, Antibes, and Satoshi Yoshida, Nice, all of France, assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Aug. 5, 1997, Appl. No. 906,531

Int. Cl.[7] **H04L** *25/36;25/40;7/00*

U.S. Cl. 375—371 **51 Claims**



35. A personal handy-phone system station comprising:

an input configured to receive a reference signal having a plurality of reference events;

a clock generator comprising:

an oscillator configured to generate a timing signal;

a counter configured to generate a sequence of counter values responsive to the timing signal; and

an output latch configured to selectively store a plurality of counter values; and

a processor coupled with the clock generator and the input, the processor being configured to detect the reference events and to compare the counter values responsive to the detection of the reference events and to compensate for phase drift within the reference signal responsive to the comparison of the counter values.

6,016,332

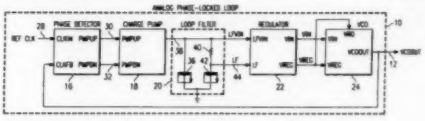
METHOD AND APPARATUS FOR EFFECTING ANALOG PHASE-LOCKED LOOP CONTROL OF A SIGNAL FREQUENCY

Patrick R. Smith, Garland, and Kevin M. Ovens, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/055,856, Aug. 15, 1997, Provisional application No. 60/055,821, Aug. 15, 1997, Provisional application No. 60/055,901, Aug. 15, 1997. This application Dec. 19, 1997, Appl. No. 994,338.

Int. Cl.[7] **H03D** *3/24*

U.S. Cl. 375—376 **7 Claims**



1. An apparatus comprising:

an analog phase-locked loop circuit having an output terminal, said analog phase-locked loop circuit including:

a phase detector circuit coupled to said output terminal, and operable to detect a phase relationship between a reference signal and a signal at said output terminal, and to output charge pump control information representative of the phase relationship;

a loop filter circuit which includes a charge-storing capacitor;

a charge pump circuit coupled to said phase detector circuit and said loop filter circuit, said charge pump circuit being responsive to the charge pump control information from said phase detector circuit and being operable to respectively increase and decrease a charge on said capacitor when the charge pump control information indicates that one of the reference signal and the signal at said output terminal respectively has a phase lead and a phase lag with respect to the other thereof;

a voltage regulator circuit responsive to said loop filter circuit and operable to output first and second oscillator control voltages; and

a voltage controlled oscillator circuit responsive to the first and second oscillator control voltages from said voltage regulator circuit and having an output which is coupled to said output terminal of said phase-locked loop circuit, said voltage controlled oscillator circuit being operable to produce at said output thereof an oscillator output signal having a frequency which varies as a function of each of the first and second oscillator control voltages, wherein said voltage controlled oscillator circuit includes:

a voltage to current converter section operable to output current-based frequency control information in response to said first and second oscillator control voltages; and

an oscillator section operable to generate the oscillator output signal and to vary the frequency of the oscillator output signal in response to the frequency control information from said voltage to current converter section;

wherein said voltage to current converter section has first and second outputs and has first and second inputs to which are respectively applied the first and second oscillator control voltages, said voltage to current converter section being operable to generate current-based first and second frequency control signals at said first and second outputs thereof, the frequency control information including the first and second frequency control signals; and

wherein said voltage to current converter section includes a first resistor coupled between said first input and said first output, a second resistor coupled between said second input and said first output, a first diode having an anode coupled to said first output and a cathode coupled to ground, a second diode having an anode coupled to said second input and a cathode coupled to said second output, and a transistor coupled between said second output and ground, said transistor having a control input coupled to said first output.

6,016,333

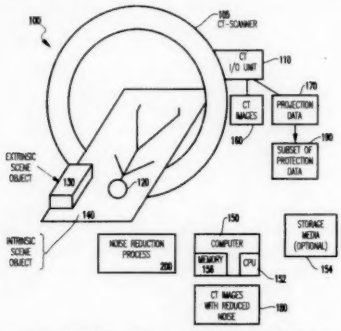
SYSTEM AND METHOD FOR IMPROVING THE QUALITY OF IMAGES PRODUCED BY CT SCANNERS OPERATING ON LOW POWER

Alan David Kalvin, Irvington, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1998, Appl. No. 78,515

Int. Cl.[7] A61B *6/03*

U.S. Cl. 378—4 **12 Claims**



1. A computer implemented method of processing computed tomography (CT) images produced by a low-powered CT scanner comprising:

generating by the CT scanner a plurality of CT images, each of said images containing noise due to low power to the CT scanner;

applying a noise reduction algorithm to the plurality of CT images that reduces noise and restores quantitative image information to the images; and

outputting an enhanced data set of CT images with reduced noise.

6,016,334

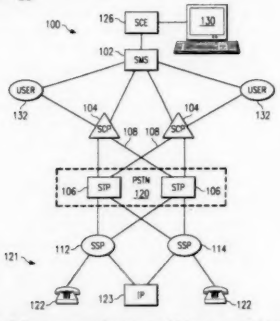
METHOD AND SYSTEM FOR AUTOMATICALLY VERIFYING PROVISIONING OF TELECOMMUNICATIONS SERVICES

Shahrooz S. Kasrai, Dallas, Tex., assignor to Alcatel USA Sourcing, L.P., Plano, Tex.

Filed Oct. 29, 1997, Appl. No. 960,051

Int. Cl.[7] H04M *3/42*

U.S. Cl. 379—15 **20 Claims**



8. A method for automatically verifying provisioning of a telephony database, the method comprising the steps of:

receiving from the telephony database a first table structure for a first table within the telephony database;

automatically generating, based on the first table structure, a test provisioning message operable to provision a table having the first table structure;

automatically generating an expected response to the test provisioning message;

transmitting the test provisioning message;

receiving an actual response to the test provisioning message;

comparing the actual response to the expected response; and

generating a result based on comparing the actual response to the expected response.

6,016,335

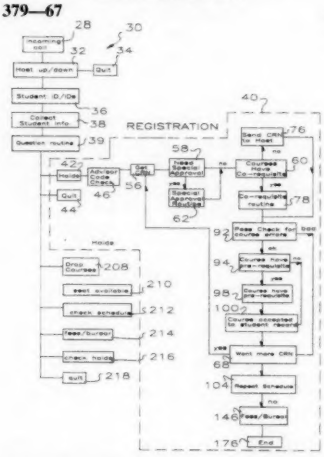
TELEPHONE REGISTRATION SYSTEM FOR SCHOOLS

Alex B. Lacy, Route 1, Box 3198A, Farmington, Ark. 72730, and Justin J. Green, 228 Pleasant Hill Dr., Winona, Minn. 55987

Continuation of application No. 08/670,539, Jun. 27, 1996, abandoned, which is a continuation of application No. 08/544,405, Nov. 16, 1995, abandoned, which is a continuation of application No. 08/388,505, Feb. 14, 1995, abandoned, which is a continuation of application No. 08/151,839, Nov. 15, 1993, abandoned, which is a continuation of application No. 07/850,838, Mar. 13, 1992, abandoned. This application Apr. 30, 1997, Appl. No. 846,968.

Int. Cl.[7] H04M *1/64*

U.S. Cl. 379—67 **11 Claims**



1. In a telephone course registration system of the type where a student, by entering information on a telephone, registers for an educational term by selecting at least one course offered by an educational institution, the registration system comprising a data processor, means connected to the data processor for generating a voice message and delivering the voice message to the telephone in response to instructions from the data processor, at least one incoming telephone line connected to the data processor, and means for matching an identification number provided by the student with a predetermined list of identification numbers corresponding to students approved for registration, the improvement comprising

a first database means, connectable with the data processor, for storing a list of courses satisfactorily completed by the student;

a second database means, connectable with the data processor, for storing a list of courses and any associated prerequisite courses which must be satisfactorily completed before a selected course may be registered for;

retrieval means for retrieving from said first database means the list of courses satisfactorily completed by the student having an identification number on the predetermined list;

determining means for searching said second database means and determining the associated prerequisite courses required for the course selected by the student; and

comparison means for comparing the list of courses satisfactorily completed by the student with the associate prerequisite courses required for the course selected by the student to determine if the student may register for the selected course,

wherein said comparison means makes the determination whether the student may register for the selected course while the student is in telephone communication with the telephone course registration means.

6,016,336

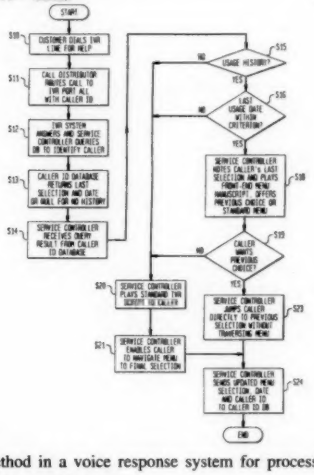
INTERACTIVE VOICE RESPONSE SYSTEM WITH CALL TRAINABLE ROUTING

Bruce Lowell Hanson, Little Silver, N.J., assignor to AT&T Corp, New York, N.Y.

Filed Nov. 18, 1997, Appl. No. 972,306

Int. Cl.[7] H04M *1/64*

U.S. Cl. 379—88.23 **19 Claims**


START
S10 CUSTOMER DIALS IVR LINE FOR HELP
S11 CALL DISTRIBUTOR ROUTES CALL TO IVR PORT ALL WITH CALLER ID
S12 IVR SYSTEM ANSWERS AND SERVICE CONTROLLER OBTAINS ID TO IDENTIFY CALLER
S13 CALLER ID DATABASE RETURNS LAST SELECTION AND DATE OR NULL FOR NO HISTORY
S14 SERVICE CONTROLLER RECEIVES QUERY RESULT FROM CALLER ID DATABASE
S15 USAGE HISTORY?
S16 LAST USAGE DATE WITHIN CRITERION?
S18 SERVICE CONTROLLER NOTES CALLER'S LAST SELECTION AND PLAYS FORM AND MENU MANUSCRIPT, OFFERS PREVIOUS CHOICE OR STANDARD MENU
S19 CALLER WANTS PREVIOUS CHOICE?
S20 SERVICE CONTROLLER PLAYS STANDARD IVR SCRIPT TO CALLER
S21 SERVICE CONTROLLER ENABLES CALLER TO NAVIGATE MENU TO FINAL SELECTION
S23 SERVICE CONTROLLER JUMPS CALLER DIRECTLY TO PREVIOUS SELECTION WITHOUT TRAVERSING MENU
S24 SERVICE CONTROLLER SENDS UPDATED MENU SELECTION, DATE AND CALLER ID TO CALLER ID DB
END
NO
YES

1. A method in a voice response system for processing a call from a caller, comprising:

comparing an identifier associated with the caller to data stored in a memory and generating a comparison result;

retrieving a usage history for the caller from the memory if the identifier associated with the caller matches one of the caller identifiers;

forming a truncated menu manuscript, based on the comparison result, the truncated manuscript having fewer options than a full menu manuscript;

selecting at least one option previously selected by the caller from the full menu manuscript as the truncated menu manuscript;

offering the truncated menu manuscript and the full menu manuscript to the caller;

prompting the caller to select an option from either the full menu manuscript or the truncated menu manuscript; and

connecting the caller to a selected option,

wherein the memory is updated after the caller elects or declines to receive the previously selected option and the caller can decline to have the memory updated after the caller elects or declines to receive the previously selected option.

6,016,337

TELEVOTING IN AN INTELLIGENT NETWORK

Mika Pykälistö, Helsinki, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland

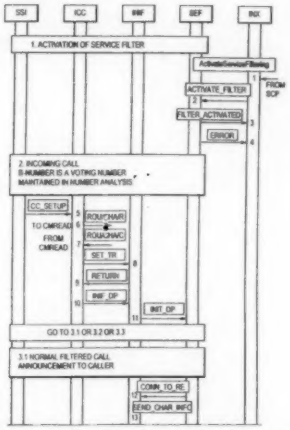
PCT No. PCT/FI96/00202, § 371 Date Oct. 10, 1997, § 102(e) Date Oct. 10, 1997, PCT Pub. No. WO96/32819, PCT Pub. Date Oct. 17, 1996

PCT Filed Apr. 12, 1996, Appl. No. 945,015

Claims priority, application Finland, Apr. 13, 1995, 951802

Int. Cl.[7] H04M *11/00*

U.S. Cl. 379—92.02 **6 Claims**



1. A method for televoting in an intelligent network, comprising:

sending a televoting activation request from a first point comprising a service control function to a second point comprising a service switching function;

counting, by the second point, calls made by network users to predetermined telephone numbers;

transmitting information on a number of calls to the first point in the intelligent network;

comparing, when the second point receives a televoting activation request from the first point, to determine whether a televoting process, which is activated by a service control point and which uses at least some same numbers of a telephone number of the televoting activation request, is in progress, and if the televoting process is in progress, the second point not starting a televoting process.

6,016,338

LOTTERY METHOD AND APPARATUS HAVING A TIERED PRIZE SCHEME

Pradeep K. Bansal, Dayton; Lee Begeja, Gillette, and Carroll W. Creswell, Basking Ridge, all of N.J., assignors to AT&T Corp., New York, N.Y.

Filed Mar. 22, 1999, Appl. No. 274,135

Int. Cl.[7] H04M *11/00*

U.S. Cl. 379—93.13 **22 Claims**

1. A method for rewarding communication service users, comprising:

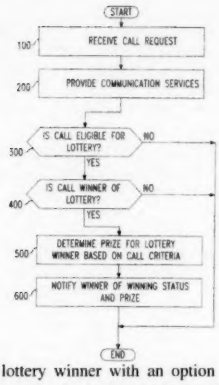
receiving an indication that communication services are to be provided to a caller so that the caller can at least receive information from a called party during a call;

identifying a party associated with the call for lottery purposes;

determining if the call is eligible for entry into a lottery;

determining if the call is a winner of the lottery;

advising the associated party that the associated party is a lottery winner while providing communication services to the caller and the called party; and



providing the lottery winner with an option to refuse a prize offered as a result of winning the lottery in exchange for a chance to win a better prize during a subsequent lottery.

6,016,339

TELECOMMUNICATION NETWORK USING SIGNALLING WITHOUT ACTIVATING ALERTING DEVICES IN CONSUMER'S PREMISES

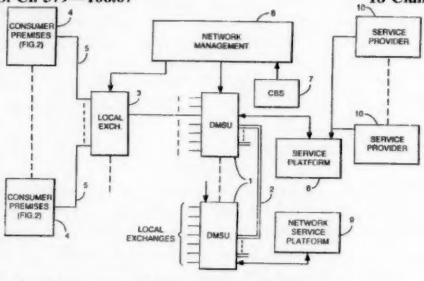
Michael D. Hoy, Ipswich; Deepak Arya, Kenton; Stuart Mason, Romford, and Martyn Saunders, Sittingbourne, all of United Kingdom, assignors to British Telecommunications public limited company, London, United Kingdom

Continuation of application No. PCT/GB95/00853, Apr. 12, 1995, which is a continuation-in-part of application No. 08/287,813, Aug. 9, 1994, abandoned. This application Oct. 18, 1996, Appl. No. 999,704.

Claims priority, application European Pat. Off., Apr. 19, 1994, 94302756

Int. Cl.[7] **H04M** *11/00*

U.S. Cl. 379—106.07 **18 Claims**



1. A telecommunications network comprising:

a plurality of switching units each connected by respective consumer lines to a multiplicity of consumer premises to provide telephony service,

each switching unit including means to provide a first consumer alert signal to cause operation of alerting devices in consumer's premises,

at least one of the switching units being responsive to signals through the network from at least one other switching unit to effect a connection to the consumer's premises to permit signalling between service providers and customer premises without causing operation of alerting devices electrically connected in parallel with the consumer line, and

means for effecting a non-alerting network connection to the consumer's premises wherein an activation signal having at least one frequency component is supplied to activate apparatus in the consumer's premises, the activation signal being cadenced as a plurality of predetermined duration pulses to indicate to the activated apparatus whether one of a tone response and a loop response is to be forwarded to the network.

6,016,340

BILLING SCHEME FOR A TELECOMMUNICATIONS NETWORK

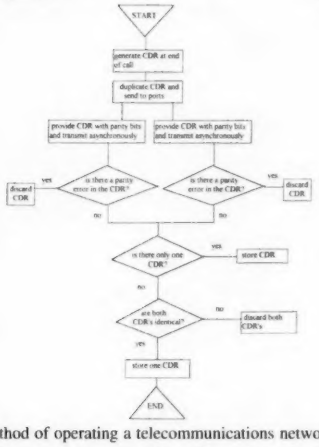
Arsavir Bayraktar, Paris, France, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 11, 1997, Appl. No. 988,579

Claims priority, application European Pat. Off., Apr. 28, 1997, 97106987; May 28, 1997, 97108586

Int. Cl.[7] **H04M** *15/00;1/24*

U.S. Cl. 379—114 **28 Claims**



1. A method of operating a telecommunications network including at least one switch means for routing calls and a processing means, comprising the steps of:

generating a billing record for a call including at least a plurality of data bytes;

duplicating each record,

generating check information from each data byte of a record and associating it with each said data byte to form a protected record,

transmitting each protected record of a duplicated pair respectively via two independent transmission lines to said processing means;

generating the associated check information byte-for-byte from each received record and comparing byte-for-byte the generated check information with the transmitted check information,

if for any one byte of a record the generated check information does not agree with the received check information, discarding that record;

if there is no inconsistency between the received and generated check information for both records of a duplicated pair, comparing the bits of the two records of the pair with each other;

if any difference is found between the records of the pair, discarding both records; and

otherwise storing the received records.

6,016,341

TELEPHONE WITH DATA ACQUISITION MEANS

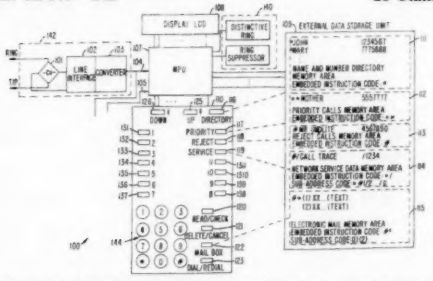
Boon-Chen Lim, Taikoosing, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Cybiotronics, Ltd., The Hong Kong Special Administrative Region of the People's Republic of China

Continuation of application No. 08/622,460, Mar. 22, 1996, abandoned, which is a continuation-in-part of application No. 08/622,043, Mar. 21, 1996, abandoned. This application Aug. 19, 1998, Appl. No. 136,205.

Claims priority, application United Kingdom, Mar. 22, 1995, 9505770

Int. Cl.[7] H04M *15/06*

U.S. Cl. 379—142 **28 Claims**



11. In a telephone device having an incoming-call interface for generating input data responsive to an incoming call signal; a classifier for determining when the input data includes an instruction code and information signals; a controller for processing the information signals according to the instruction code; a data storage unit having a plurality of memory areas for storing a plurality of information signals received from said incoming-call interface; a display unit; a user interface; and a sound transducer, a method for automatically acquiring, processing, and storing telephone service information retrievable from conventional telephone lines or another specified input port, said method comprising the steps of:

(a) receiving a plurality of input data signal from said incoming-call interface;

(b) determining whether each one of said input data signals includes an instruction code with a plurality of information signals; and

(c) processing said plurality of information signals according to said instruction code when said plurality of input signals includes said instruction code, and storing said plurality of information signals into one of said plurality memory areas of said data storage unit according to said instruction code.

6,016,342

TELECOMMUNICATIONS APPARATUS FOR INITIATING CALLS BASED ON PAST CALLING PATTERNS

Alan Ira Schwartz, Bridgewater, N.J., assignor to AT&T Corp., New York, N.Y.

Filed Jun. 18, 1997, Appl. No. 878,358

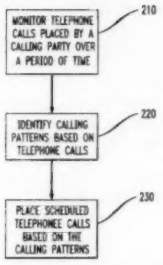
Int. Cl.[7] H04M *3/48*

U.S. Cl. 379—209 **12 Claims**

9. A method of initiating telephone calls for a calling party to called parties, comprising steps of:

monitoring telephone calls placed by the calling party over a period of time;

identifying a repetitive calling pattern based on the monitored telephone calls; and


MONITOR TELEPHONE CALLS PLACED BY A CALLING PARTY OVER A PERIOD OF TIME
210
IDENTIFY CALLING PATTERNS BASED ON TELEPHONE CALLS
220
PLACE SCHEDULED TELEPHONEE CALLS BASED ON THE CALLING PATTERNS
230

placing a scheduled telephone call based on the calling pattern, wherein all of the method steps are implemented by one of a local switch, a tandem switch and a toll switch.

6,016,343

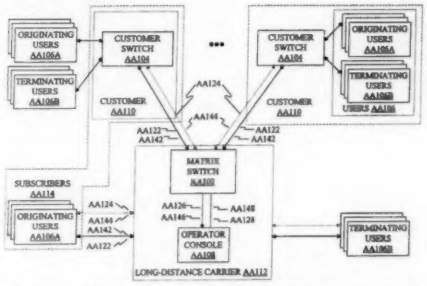
CALL-PROCESSING SYSTEM AND METHOD

Steven J. Hogan; Kristi T. Feltz; Douglas R. Murdock; Todd A. Goodman; David J. Vercande; Michael R. Tangeman; Eric M. Busch; Raghavan Kripakaran; Madhigubba G. Jayasimha; Keith E. Smith; Mark A. Austin, and Dana Bruce Berry, all of Cedar Rapids, Iowa, assignors to Link USA Corporation, Cedar Rapids, Iowa

Division of application No. 08/136,211, Oct. 15, 1993, Pat. No. 5,590,181. This application Aug. 20, 1996, Appl. No. 697,134. This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04M *3/00;7/00*

U.S. Cl. 379—242 **22 Claims**



1. In an environment that includes a matrix switch having a matrix switch processor, a system for providing enhanced call processing features for telephone calls that are routed to a destination by the matrix switch, wherein each of the telephone calls comprise a call audio portion and a call data portion, the call-processing system comprising:

a network control processor coupled to a matrix switch, said matrix switch receiving a call audio portion of a telephone call, said network control processor providing an interface between said matrix switch and a common channel signaling network such that said network control processor receives a call data portion corresponding to said call audio portion from said common channel signaling network, said network control processor determining a routing for said call audio portion of said telephone call, and sending switch control data to a matrix switch processor associated with said matrix switch to effect said routing of said call audio portion of said telephone call.

6,016,344
TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

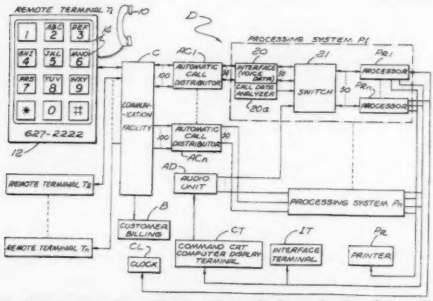
Ronald A. Katz, 570 S. Mapleton Dr., Los Angeles, Calif. 90024

Continuation of application No. 07/194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of application No. 07/018,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of application No. 06/753,299, Jul. 10, 1985, abandoned. This application Apr. 10, 1989, Appl. No. 335,923.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04M *1/274*

U.S. Cl. 379—260 **5 Claims**



1. Apparatus to be utilized with a telephone facility for on-line handling of customer data contained in a memory comprising:

an operator terminal for use by a person to communicate through the telephone facility;

interface switching means for receiving incoming calls;

a voice generator for providing predetermined messages to a caller;

means responsive to tone signals placed by the caller for providing control signals;

computer means coupled to said voice generator for causing said messages to be provided to said caller, coupled to said interface switching means for connecting an incoming call by said caller to said operator terminal, and responsive to said control signals for determining whether the caller is requesting the assistance of an operator;

whereby, if said assistance is requested, said computer means causes said caller to be connected to said operator terminal and said operator terminal provides data entries to said memory, and said memory is updated with customer data on a selected customer by incorporating said data entries into said data on said customer; and

whereby, if said assistance is not requested, said computer means provides said control signals as data entries to said memory, and said memory is updated with said customer data on said selected customer by incorporating said control signals as data entries into said data on said customer.

6,016,345
METHOD AND SYSTEM FOR ANONYMOUSLY TESTING FOR A HUMAN MALADY

Richard A. Quattrocchi, Barrington, Ill., assignor to Home Access Health Corporation, Hoffman Estates, Ill.

Continuation of application No. 08/420,694, Apr. 12, 1995, abandoned, which is a continuation-in-part of application No. 08/146,307, Nov. 2, 1993, abandoned. This application Mar. 21, 1997, Appl. No. 822,166.

Int. Cl.[7] H04M *3/00*

U.S. Cl. 379—265 **17 Claims**

1. In a confidential medical testing system, a method for routing and handling a plurality of in-coming telephone calls initiated by a plurality of anonymous callers, each of said anonymous callers having previously provided a specimen for evaluation to a medical testing laboratory prior to said in-coming calls, comprising the steps of:

(A) receiving a telephone call initiated by an anonymous caller;

(B) prompting said anonymous caller to transmit a personal identification code corresponding to a specimen previously provided to said medical testing laboratory by said anonymous caller prior to placing said telephone call;

(C) receiving said personal identification code;

(D) retrieving, in response to said personal identification code, test result information associated with said specimen previously provided to said medical testing laboratory by said anonymous caller;

(E) selecting, in response to said test result information, a call handler from a plurality of call handlers for processing said telephone call;

(F) routing said telephone call to said selected call handler; and

(G) providing said test result information to said anonymous caller with said selected call handler.

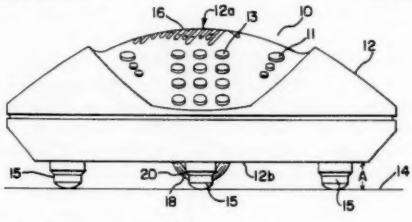
6,016,346
LOW-PROFILE SPEAKERPHONE WITH DOWNWARD ORIENTED MICROPHONE CONFIGURATION

Stephen P. Rittmueller, Chicago; Frank J. Annerino, Rolling Meadows, both of Ill.; Mark R. Dreher, Boulder, Colo., and Scott A. Chastain, Foster, Calif., assignors to 3Com Corporation, Santa Clara, Calif.

Filed Oct. 21, 1997, Appl. No. 955,053

Int. Cl.[7] H04M *1/00*

U.S. Cl. 379—420 **11 Claims**



1. A speakerphone, comprising:

(a) a housing having an upper surface and a lower surface, with respect to a support surface, the lower surface of the housing having a domed configuration;

(b) the housing spaced from the support surface by support members;

(c) a speaker situated to direct its output upwards through the upper surface of the housing; and

(d) a downward-oriented microphone on the lower surface of the housing, located substantially at the highest point of the domed lower surface.

6,016,347
OPTICAL SWITCH FOR HEADSET

John Harry Magnasco, San Jose, and Eric Maxon, Scotts Valley, both of Calif., assignors to Hello Direct, Inc., San Jose, Calif.

Filed Mar. 4, 1998, Appl. No. 34,629

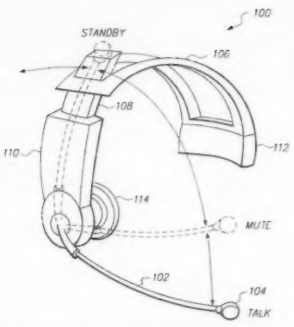
Int. Cl.[7] H04M *1/00*

U.S. Cl. 379—430 **36 Claims**

1. A headset having an optical switch for controlling an operative condition of the headset, the headset comprising:

a. means for securing the headset to a user;

b. a microphone boom coupled to the means for securing wherein the microphone boom is rotatable with respect to the means for securing;



c. a rotator element coupled to the microphone boom wherein the rotator element rotates with respect to the means for securing along with the microphone boom, portions of the rotator element having dissimilar optical properties; and

d. an optical receiver having a fixed first position relative to the means for securing and having a first field of view, the optical receiver for forming a first binary representation of the optical properties of the portion of the rotator element within the first field of view.

6,016,348

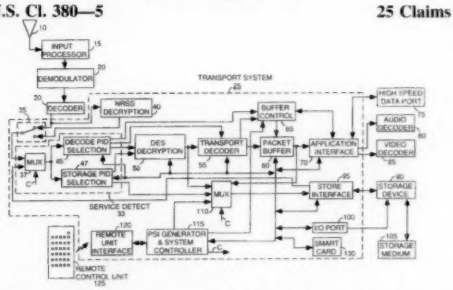
DECODING SYSTEM AND DATA FORMAT FOR PROCESSING AND STORING ENCRYPTED BROADCAST, CABLE OR SATELLITE VIDEO DATA

Harold Blatter; Thomas Edward Horlander; Kevin Elliott Bridgewater, all of Indianapolis, and Michael Scott Deiss, Zionsville, all of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Nov. 27, 1996, Appl. No. 762,488

Int. Cl.[7] **H04N** *7/167*

U.S. Cl. 380—5 **25 Claims**



1. A conditional access processor for processing a digital datastream containing encrypted program data and an encryption code, comprising:

first algorithm means for decrypting said encryption code to provide an encryption key; and

second algorithm means for encrypting said encryption key, wherein

said second encryption algorithm is different from said first encryption algorithm wherein

said conditional access system resides within a host device;

said first and second algorithms are contained in an electronic device employed within said conditional access system; and

said electronic device is insertable into said host device.

6,016,349

CELLULAR PHONE PROVIDED WITH LEGAL IDENTIFICATION MEANS OF THE OWNER OF THE CELLULAR PHONE

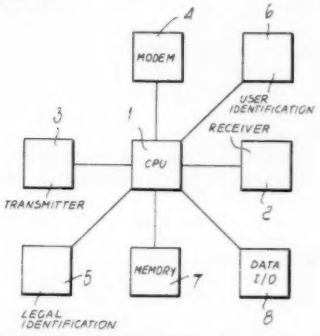
Lorenzo Musa, Via Ugo Foscolo, 1, 15100 Alessandria, Italy

Filed Dec. 18, 1996, Appl. No. 768,383

Claims priority, application Italy, Dec. 20, 1995, MI95A2693

Int. Cl.[7] **H04K** *1/00*

U.S. Cl. 380—23 **10 Claims**



1. A cellular phone comprising a central processing unit, receiving and transmitting means, and data input/output means, further comprising means for the legal identification of the owner of said cellular phone and data sending/receiving means, said identification means generating encrypted information relating to personal data that unequivocally identify the owner of said cellular phone for transmission, through said sending/receiving means, to a decryption and identification station, said means for the legal identification of the owner being actuatable only through a physical and unique feature of the legal owner of phone.

6,016,350

ENCRYPTION APPARATUS FOR ENABLING ENCRYPTION AND NON-ENCRYPTION TERMINALS TO BE CONNECTED ON THE SAME NETWORK

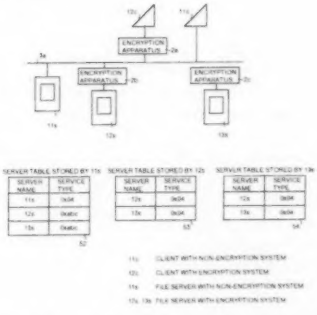
Chieko Funabe; Yoshimasa Baba; Shoichiro Seno, and Yuuji Koui, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1997, Appl. No. 853,919

Claims priority, application Japan, Jun. 28, 1996, 8-169950

Int. Cl.[7] **H04L** *9/00;9/32;* **H04K** *1/00*

U.S. Cl. 380—49 **35 Claims**



1. A method for use in an encryption apparatus, said method comprising:

receiving service type information from a network signifying whether a sending device is a non-encryption device or an encryption device;

converting the received service type information when such information signifies an encryption device to service type information signifying a non-encryption device; and

preventing data communication with the sending device when the received service type information signifies a non-encryption device.

6,016,351

DIRECTED RADIATOR WITH MODULATED ULTRASONIC SOUND

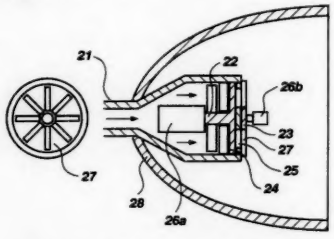
Hans-Joachim Raida, Cologne, and Oskar Bschorr, Munich, both of Germany, assignors to American Technology Corporation, Poway, Calif.

Filed Jul. 16, 1997, Appl. No. 895,486

Claims priority, application Germany, Jul. 16, 1996, 196 28 849

Int. Cl.[7] H04B *3/00*

U.S. Cl. 381—77 **34 Claims**



1. A method for propagating audible sound from an ultrasonic emitter, comprising the steps of:

a) activating an ultrasonic pneumatic radiator for emitting ultrasonic sound as a carrier source for the audible sound to be propagated;

b) modulating the ultrasonic sound by controlled variation of absorption of ultrasonic power along the beam within air as a propagating medium to develop a virtual array of monopole and dipole radiating sources within the air operable within an audible frequency range; and

c) propagating audible sound waves having a primary direction of propagation along the beam as a consequence of retarded absorption of the ultrasonic power along the beam and corresponding to at least one desired frequency within the audible frequency range.

6,016,352

LOW DISTORTION AUDIO MUTING CIRCUIT

Bradley Allen Barmore, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 20, 1997, Appl. No. 974,974

Int. Cl.[7] H04B *15/00*

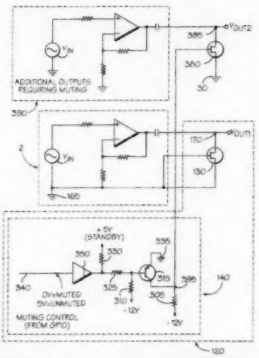
U.S. Cl. 381—94.5 **16 Claims**

1. A muting circuit comprising:

a switching device having an enable input and being adapted to be coupled between an audio output and ground, the switching device being on when the enable input is at a deenergized voltage level; and

a mute controller coupled to receive a mute signal and provide a signal to the enable input of the switching device to bias the switching device on, the mute controller including:

an open collector buffer having an input and output, the input being coupled to receive the mute signal,



a transistor having an enable input, the transistor coupled between ground and the enable input of the switching device,

a first resistor coupled between a first voltage source and the enable input of the switching device,

a second resistor coupled between the output of the open collector buffer and the enable input of the transistor,

a third resistor coupled between the enable input of the transistor and a second voltage source, and

a fourth resistor coupled between the output of the open collector buffer and a third voltage source.

6,016,353

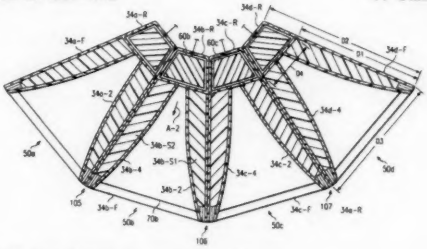
LARGE SCALE SOUND REPRODUCTION SYSTEM HAVING CROSS-CABINET HORIZONTAL ARRAY OF HORN ELEMENTS

David W. Gunness, Sutton, Mass., assignor to Eastern Acoustic Works, Inc., Whitinsville, Mass.

Continuation-in-part of application No. 08/921,185, Aug. 29, 1997. This application Oct. 31, 1997, Appl. No. 962,425.

Int. Cl.[7] H04R *1/02; 1/20*

U.S. Cl. 381—342 **35 Claims**



32. A loudspeaker system, comprising:

a first side wall having an interior side surface;

a second, shared, side wall having first and second interior side surfaces;

a third side wall having an interior side surface;

said interior side surface of said first side wall and said first interior side surface of said second, shared, wall partially defining a first horn of said loudspeaker system;

said second interior side surface of said second, shared, side wall and said interior side surface of said third side wall partially defining a second horn of said loudspeaker system;

said first and second interior side surfaces of said second, shared, wall being substantially parallel to each other.

6,016,354

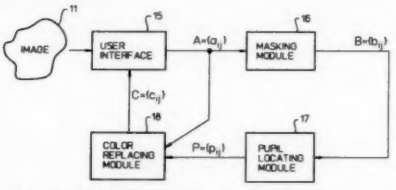
APPARATUS AND A METHOD FOR REDUCING RED-EYE IN A DIGITAL IMAGE

Qian Lin, Santa Clara; Daniel R. Tretter, Mountain View; Konstantinos Konstantinides, San Jose, and Andrew Patti, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 23, 1997, Appl. No. 956,380

Int. Cl.[7] **G06K** *9/00*

U.S. Cl. 382—117 **11 Claims**



1. A red-eye reduction system, comprising:

(A) a masking module that converts an image into a mask having first state areas representing red color pixels and second state areas representing other color pixels, wherein the image includes an eye with a red pupil;

(B) a pupil locating module coupled to the masking module to locate a substantially first state area in the mask that resembles a pupil by determining if the substantially first state area is a substantially largest first state area within the mask, wherein determining that substantially first state area resembles a pupil, the pupil locating module modifies the mask by changing all other first state areas in the mask into second state such that the modified mask only has the substantially first state areas;

(C) a color replacing module coupled to the pupil locating module to change the red color pixels in the area into a predetermined color, wherein the color replacing module also adjust boundary of the area by changing the colors of pixels in close proximity to the, area to the predetermined color if the color of these pixels is determined to be sufficiently close to red.

6,016,355

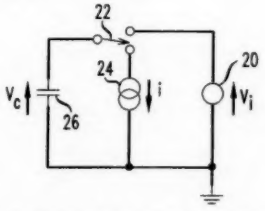
CAPACITIVE FINGERPRINT ACQUISITION SENSOR

Alexander George Dickinson, Laguna Beach, Calif.; Ross McPherson, Denville, N.J.; Sunetra Mendis, Palo Alto, Calif.; Paul C. Ross, Morris Plains, and John A. Tyson, Washington Township, both of N.J., assignors to Veridicom, Inc., Santa Clara, Calif.

Filed Dec. 15, 1995, Appl. No. 573,100

Int. Cl.[7] **G06K** *9/28;* **G01R** *29/24*

U.S. Cl. 382—124 **15 Claims**



1. A sensor for detecting topographic variations on an object, comprising:

an array of sensing elements disposed on a substrate and each having a parasitic capacitance;

an insulating receiving surface disposed over said array of sensing elements, said receiving surface being adapted to receive the object such that a sensing element and a portion of said object located there above creates a measurable change in capacitance with respect to said parasitic capacitance;

an electronic circuit coupled to said array of sensing elements for measuring relative magnitudes of said measurable change in capacitance of the sensing elements as the sensing elements are distributed over the array including, a voltage source for imparting a first potential on said sensing elements; a current source for draining charge at a constant rate for a prescribed method of time from said respective sensing elements in said array after the first potential has been applied; and a circuit for reading a second potential from each of said respective sensing elements in the array after the prescribed period of time, and outputing a signal indicating the relative capacitance caused by the object on each respective sensing element in the array based on the first and second potentials, the constant rate of discharge and the prescribed period of time.

6,016,356

IMAGE SUPERPOSITION PROCESSING METHOD

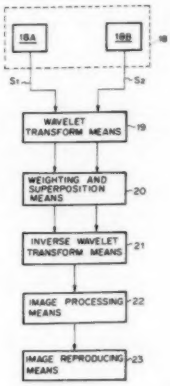
Wataru Ito; Hiroaki Yasuda, and Shoji Nanami, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Continuation of application No. 08/406,076, Mar. 17, 1995, abandoned. This application Oct. 24, 1997, Appl. No. 959,970.

Claims priority, application Japan, Mar. 31, 1994, 6-062476; Apr. 8, 1994, 6-070748; Apr. 15, 1994, 6-077034; Apr. 15, 1994, 6-077035; Jun. 30, 1994, 6-149380; Oct. 14, 1994, 6-249614; Oct. 17, 1994, 6-250909

Int. Cl.[7] **G06K** *9/00*

U.S. Cl. 382—132 **43 Claims**



1. A superposition processing method for a radiation image, comprising the steps of:

i) obtaining a plurality of image signals representing one or more radiation images of an object, each of the plurality of image signals having different respective frequency characteristics for noise, each of the plurality of image signals having respective image signal components,

ii) for each of a plurality of different frequency bands, weighting the respective image signal components with weight factors to provide weighted image signal components, wherein, for each of said image signals, all the respective image signal components are identically weighted, and

iii) adding all of the weighted image signal components to one another to obtain an addition signal representing the superposition of said plurality of image signals,

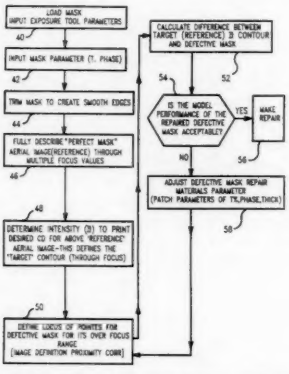
wherein values of the weight factors used for ones of the plurality of image signal components having a low signal-to-noise ratio are smaller than values of the weight factors used for ones of the plurality of image signal components having a high signal-to-noise ratio, and

wherein said weight factors are determined, at each of said plurality of different frequency bands, based on said different respective frequency characteristics for noise for said respective image signal.

6,016,357
FEEDBACK METHOD TO REPAIR PHASE SHIFT MASKS

Timothy E. Neary, Essex Junction; Edward W. Conrad, Jeffersonville, and Orest Bula, Shelburne, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1997, Appl. No. 876,931
Int. Cl.[7] G06K *9/00*; G03F *9/00*
U.S. Cl. 382—144 **23 Claims**



1. A method of repairing a semiconductor mask comprising the steps of:

a) providing a semiconductor mask having a defect;

b) illuminating said mask to create an aerial image of said mask;

c) analyzing said aerial image of said mask including degree of transmission and degree of phase shift of said mask;

d) detecting said defect in said mask from said aerial image;

e) determining unique parameters for repairing said mask defect utilizing the aerial image analysis including degree of transmission and degree of phase shift of a repair; and

f) repairing said mask in accordance with said parameters to correct said mask defect.

6,016,358
METHOD AND APPARATUS FOR ALIGNING THE POSITION OF DIE ON A WAFER TABLE

Subramanian Balamurugan, Singapore, Singapore, assignor to Texas Instruments Incorporated, Dallas, Tex.

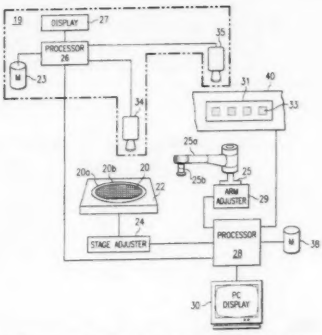
Division of application No. 08/667,246, Jun. 20, 1996, Pat. No. 5,851,848. This application Feb. 18, 1998, Appl. No. 33,745.
Claims priority, application Singapore, Jan. 31, 1996, 9600739-8
Int. Cl.[7] G06K *9/00*
U.S. Cl. 382—151 **4 Claims**

1. An apparatus for relative positioning a die on a wafer table to a die pick up device after cutting a wafer into dies comprising, in combination:

means for repeatedly measuring street width between a series of dies for both horizontal and vertical axes;

means coupled to said measuring means for averaging said street widths, and for generating a control signal proportional to an average street width plus a nominal die dimension; and

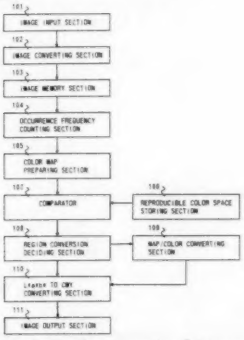
means coupled to said wafer table and responsive to said control signal to move the relative position of the die on the wafer table with respect to the die pickup device a distance proportional to the average street width plus a nominal die dimension.



6,016,359
COLOR IMAGE CONVERTING APPARATUS AND METHOD FOR DETERMINING WHEN A HOMOGENEOUS COLOR SPACE IS LOCATED OUTSIDE OF A REPRODUCIBLE COLOR SPACE

Manabu Komatsu, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of application No. 08/359,146, Dec. 19, 1994, abandoned. This application Nov. 13, 1997, Appl. No. 970,153.
Claims priority, application Japan, Dec. 29, 1993, 5-354615
Int. Cl.[7] G06K *9/00*
U.S. Cl. 382—162 **6 Claims**



1. A color image converting apparatus for executing color processing on an input color image and converting the input color image to color image data for a color image forming device to form an image, comprising:

a memory for storing a range of a reproducible color space of said color image forming device in a homogeneous color space;

a converter for converting an input color image signal to a signal for a homogeneous color space;

a divider for dividing a homogeneous color space concentrically and radially on a plane within an area having constant brightness into a specified number of unit regions;

an occurrence frequency counter for obtaining an occurrence frequency of a signal for a homogeneous color space included in each of said unit regions;

a discriminator for comparing each of said unit regions to the range of reproducible color space stored in said memory and making a determination as to whether a signal for a homogeneous color space exists outside the range of said reproducible color space;

a compression deciding device for deciding, when it is determined by said discriminator that a signal for a homogeneous color space exists outside said range of reproducible color space, the necessity of color space compression and compressing direction for each of said unit regions present on a plane within an area having constant brightness in a homogeneous color space according to the occurrence frequency of a signal for a homogeneous color space of each unit region; and

a mapping device for mapping image data on unit regions subjected to color space compression in said compression deciding device onto other regions in said compressing direction.

6,016,360

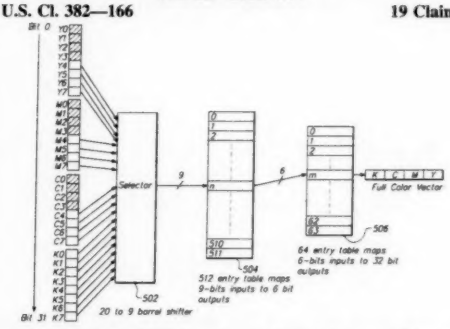
METHOD AND APPARATUS FOR ENCODING COLOR IMAGE DATA

Hungviet H. Nguyen, Fremont, and Riaz A. Moledina, Woodside, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of application No. 08/463,787, Jun. 5, 1995, abandoned. This application Oct. 15, 1997, Appl. No. 949,693.

Int. Cl.[7] G06K *9/36*

U.S. Cl. 382—166 **19 Claims**



1. A method for processing a frame of image data comprising the steps of:

representing a color of each pixel in said frame of image data by at least one color component;

compressing said frame of image data, said step of compressing further including steps of:

(i) prequantizing the at least one color component of the image data by selectively eliminating all but at least one most significant bit of each at least one color component used to represent the color of each pixel in said frame of image data; and

(ii) encoding the remaining bits of the prequantized data to compress the prequantized data;

storing the encoded remaining bits as compressed image data; and

varying the bits which are selectively eliminated from each at least one color component, from one frame of said image data relative to another frame of said image data.

6,016,361

METHOD AND APPARATUS FOR COMPRESSING BINARY DATA USING PATTERN MATCHING ENCODING

Takahiro Hongu, and Kouichirou Hirao, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

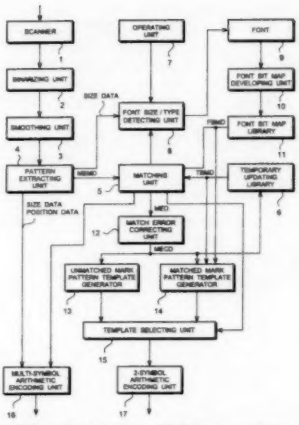
Filed Nov. 5, 1997, Appl. No. 964,633

Claims priority, application Japan, Nov. 5, 1996, 8-308771

Int. Cl.[7] G06K *9/36*

U.S. Cl. 382—209 **19 Claims**

1. A pattern matching encoding apparatus for encoding unit patterns extracted from input binary image data based on a result



of matching of the unit patterns with library patterns, said pattern matching encoding apparatus comprising:

a first memory means for storing first library patterns capable of being updated according to the unit patterns;

a second memory means for storing second library patterns of a preliminarily designated font; and

a pattern matching means for executing a pattern matching process of matching the unit patterns by comparison of the unit patterns with the first library patterns and the second library patterns.

6,016,362

APPARATUS AND METHOD FOR IMAGE CODING AND DECODING

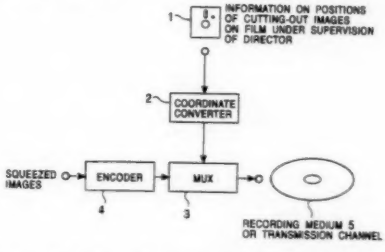
Motoki Kato, and Takashi Kojima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 3, 1997, Appl. No. 887,770

Claims priority, application Japan, Jul. 9, 1996, 8-178958

Int. Cl.[7] G06K *9/36*

U.S. Cl. 382—232 **9 Claims**



1. A method of encoding a squeezed image obtained by squeezing an image on a film, said method comprising the steps of:

encoding the squeezed image;

generating cutting-out position information representing positions at which a portion of the image on the film is cut out under supervision of an operator who made the image on the film;

converting the cutting-out position information with respect to the image on the film into cutting-out position information with respect to the squeezed image; and

multiplexing the encoded squeezed image and the cutting-out position information with respect to the squeezed image.

6,016,363

IMAGE INFORMATION ENCODING/DECODING SYSTEM

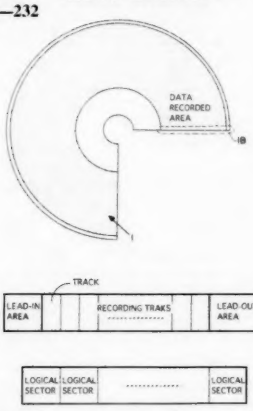
Shinichi Kikuchi, Yokohama; Tetsuya Kitamura, Kamae; Hideki Mimura, and Kazuhiko Taira, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 08/806,684, Feb. 26, 1997, Pat. No. 5,845,021, which is a division of application No. 08/577,100, Dec. 22, 1995, Pat. No. 5,721,720. This application Jul. 20, 1998, Appl. No. 118,851.

Claims priority, application Japan, Dec. 28, 1994, 6-327460

Int. Cl.[7] G06K *9/36*

U.S. Cl. 382—232 **3 Claims**



1. A system constituted by a combination of encoding processing and decoding processing,

wherein an integral body of information is formed of a plurality of pixel data each defined by a plurality of bits, a data block containing same continuous pixel data is compressed as one unit of compression, the encoding processing comprising:

first encoding for specifying the data block of the one compression unit in the integral body of information;

second encoding for generating a compressed unit data block based on a coding header, a number of pixels followed, and pixel data, wherein no bits are assigned to the coding header when a number of the same continuous pixel data is equal to or less than a first predetermined number, and at least two bits but less than a prescribed number of bits are assigned to the coding header when the number of the same continuous pixel data is greater than the first predetermined number but less than a second predetermined number, wherein the number of pixels followed indicates the number of the same continuous pixel data, and wherein the pixel data indicates the same pixel data in the data block of the one compression unit;

third encoding for constituting the coding header by a specific number of bits which indicates that the same pixel data continues up to an end of a finite length data line on which the integral body of information is arranged;

fourth encoding for adding dummy bit data to the data block of the one compression unit so that a total bit length of at least one data block of the one compression unit becomes a multiple of eight bits, if the total bit length is not a multiple of eight when generation of the data block of the one compression unit on the data line is completed,

and wherein a bit train compressed in unit of the data block of the same continuous pixel data in the integral body of information is expanded, the decoding processing comprising:

first decoding for detecting the coding header from the data block of the one compression unit in the integral body of information;

second decoding for immediately fetching a predetermined number of bits as the number data of the pixels followed, when no bits are assigned to the coding header detected by the first decoding;

third decoding for detecting, from the data block of the one compression unit, the number data of the pixels followed in accordance with a content of the coding header, when prescribed bits are assigned to the coding header detected by the first decoding;

fourth decoding for determining a content of the pixel data in an uncompressed data block of the one compression unit in accordance with a remainder of the data block of the one compression unit, from which removed are the coding header detected by the first decoding step and the number data of the pixels followed detected by either the second decoding step or the third decoding;

fifth decoding for arranging bit data of the content determined by the fourth decoding, by a number indicated by the number data of the pixels followed detected by either the second decoding or the third decoding, so as to restore a pattern of uncompressed pixel data of the one compression unit; and

sixth decoding for arranging, up to the end of the data line, a content of bits subsequent to the coding header, when the integral body of information is arranged on the data line of a finite bit length, and when the coding header includes a specific number of bits indicating that the same pixel data continues up to an end of the data line, wherein

said integral body of information includes a specific header comprising information of a size of said integral body of information.

6,016,364

IMAGE INFORMATION ENCODING/DECODING SYSTEM

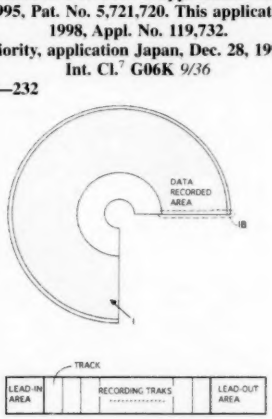
Shinichi Kikuchi, Yokohama; Tetsuya Kitamura, Kamae; Hideki Mimura, and Kazuhiko Taira, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 08/806,684, Feb. 26, 1997, Pat. No. 5,845,021, which is a division of application No. 08/577,100, Dec. 22, 1995, Pat. No. 5,721,720. This application Jul. 21, 1998, Appl. No. 119,732.

Claims priority, application Japan, Dec. 28, 1994, 6-327460

Int. Cl.[7] G06K *9/36*

U.S. Cl. 382—232 **3 Claims**



1. A system of encoding and decoding an integral body of information which is formed of a plurality of pixel data each defined by a predetermined number of bits, wherein a data block, containing same continuous pixel data, is compressed as one unit of compression and a bit train of the compressed data block is then expanded, the system comprising a combination of:

(a) encoding processing including:

generating a compressed unit data block in accordance with a coding header corresponding to a continuing number of the same pixel data in the data block of the one compression unit, with a number of pixels followed indicating the continuing number of the same pixel data, and with data representing the same pixel data in the data block of the one compression unit, and

(b) decoding processing including:

coding header detecting for detecting the coding header from the data block of the one compression unit generated by the generating of the compressed unit data block of the encoding processing, wherein the coding header indicates the number of pixels followed, or indicates a group of the number of pixels followed and the same pixel data;

continuous pixel number detecting for detecting from the data block the number data of the pixels followed, after the coding header is detected;

pixel data determining for determining a content of the pixel data in an uncompressed data block of the one compression unit, in accordance with a remainder of the data block of the one compression unit, from which are removed the detected coding header detected by the coding header detecting and the detected number data of the pixels followed detected by the continuous pixel number detecting; and

pixel pattern restoration for arranging bit data of the determined content determined by the pixel data determining, by a number indicated by the detected number data of the pixels followed detected by the continuous pixel number detecting, so as to restore a pattern of uncompressed pixel data of the one compression unit, wherein

the integral body of information includes a specific header comprising information of a size of the integral body of information.

6,016,365

DECODER HAVING ADAPTIVE FUNCTION OF ELIMINATING BLOCK EFFECT

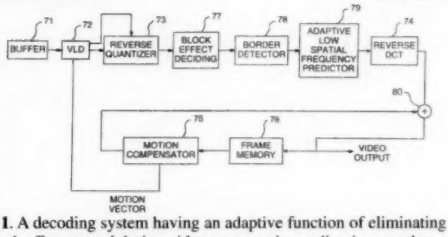
Tae Hwan Shin; Jong Nam Kim; Tae Sun Choi, all of Kwangju, and Il Yoon, Koonpo-si, all of Rep. of Korea, assignors to Samsung Electro-Mechanics Co., Ltd., Rep. of Korea

Filed Nov. 26, 1997, Appl. No. 978,555

Claims priority, application Rep. of Korea, Oct. 16, 1997, 97-53012

Int. Cl.[7] G06K *9/36;9/46*

U.S. Cl. 382—233 **12 Claims**



1. A decoding system having an adaptive function of eliminating block effect caused during video compressive coding in accordance with an image object, the decoder comprising:

a variable length decoder (VLD) for variable length decoding a compressed signal to output a motion vector signal and a quantized signal of spatial frequency having a DC component and an AC component;

an 8*8 reverse quantizer for reversely quantizing the quantized signal of spatial frequency;

a block effect detecting unit for detecting block effect of an image object;

a border detecting unit for detecting a bordering block of the block effected-image object in a spatial frequency area to presume the AC component;

an adaptive low spatial frequency predictor for adaptively presuming the value of the AC components of the current block by replacing the value of the DC component of the bordering block with the value of the DC component of the current block and calculating the replaced value of the DC component of the current block in a case where the current block is affected by the bordering block and by calculating the value of the DC components around the current block in a case where the current block is not affected by the bordering block;

an 8*8 reverse DCT transformer for converting the signal having DC component and AC component in a spatial frequency area into a signal of pixel area;

a motion compensator for compensating for motion using a motion vector signal; and

a frame memory for storing the signal of pixel area from the reverse DCT transformer.

6,016,366

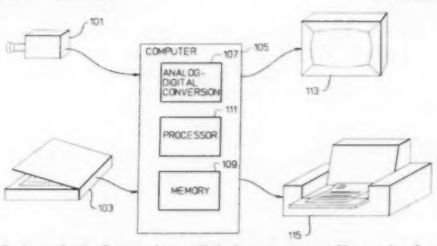
METHOD OF FILTERING IMAGES USING IMAGE COMPRESSIBILITY TO DETERMINE THRESHOLD PARAMETER

Kontantinos Konstantinides, San Jose; Balas K. Natarajan, Los Gatos, and Gregory S. Yovanof, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of application No. 08/596,800, Feb. 5, 1996, Pat. No. 5,787,209. This application Apr. 7, 1998, Appl. No. 56,456.

Int. Cl.[7] H04B *1/66*

U.S. Cl. 382—260 **14 Claims**



1. A method of operating a digital processor to filter noise from an image, said method comprising:

filtering data for at least a portion of the image to produce a set of filtered data;

compressing the set of filtered data to produce a first set of compressed data;

compressing another set of data for the image, to produce a second set of compressed data; and

analyzing relative compressibility of at least the first and second sets of compressed data, and selecting at least one threshold value in dependence upon relative compressibility;

filtering noise from the image using the at least one threshold value.

6,016,367

METHOD FOR THE ACQUISITION OF IMAGES BY CONFOCAL

Pier Alberto Benedetti, Pisa; Valtere Evangelista, Capraia e Limite; Dante Guidarini, and Stefano Vestri, both of Pisa, all of Italy, assignors to Consiglio Nazionale delle Ricerche, Roma, Italy

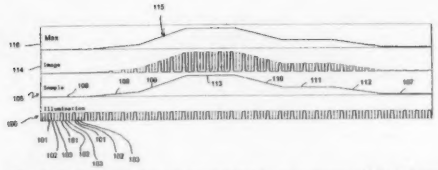
Filed Sep. 22, 1997, Appl. No. 935,298

Claims priority, application Italy, Sep. 25, 1996, FI96A0220

Int. Cl.[7] H01J *3/14*

U.S. Cl. 382—275 **9 Claims**

1. A confocal microscopy method for acquiring a confocal image of an object to be analyzed, comprising:



illuminating the object to be analyzed by a group of light beams concentrated on positions in a focus plane, the positions being arranged on the focus plane according to an ordered grid of light sources,

carrying out a complete illumination of the area under examination by systematically displacing (X) the grid, so as to cover all interposed spaces,

acquiring a confocal optical section by first of all acquiring through an image electronic sensor a set of partial images corresponding to each position of said ordered grid of light sources on the focus plane, and

calculating said confocal image by taking only maxima of transmitted light (Max) among all image elements of each captured confocal image, said image being expressed as

$$\text{confocal image}=\text{Max}(x).$$

6,016,368

APPARATUS FOR DERIVING POSITIONAL INFORMATION ON BOX-SHAPED OBJECTS, AND METHOD IN WHICH APPARATUS IS USED

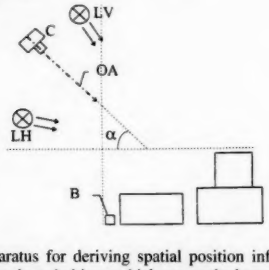
Jacob Koomen, Castricum, Netherlands, assignor to Koninklijke KPN N.V., Groningen, Netherlands

Filed Feb. 12, 1998, Appl. No. 22,762

Claims priority, application Netherlands, Apr. 2, 1997, 1005705

Int. Cl.[7] G06K *9/00*

U.S. Cl. 382—291 **15 Claims**



1. An apparatus for deriving spatial position information with respect to box-shaped objects which are stacked on top of and next to one another in a manner such that lateral surfaces of the objects in the stack are substantially parallel, said apparatus comprising:

a camera for obtaining image information with respect to said objects, said camera being positioned at a first position obliquely above and in front of the stack such that an optical axis of the camera is located in a vertical plane which is substantially perpendicular to the lateral surfaces of the objects which, seen from the camera, are front surfaces of the objects, said optical axis making a first angle α with respect to a horizontal surface on which the stack rests;

a first light source for emitting substantially bundled light in a direction at a second angle with respect to the horizontal surface on which the stack rests, said first light source being positioned at a second position and said second angle being greater than α;

a second light source for emitting substantially bundled light in a direction at a third angle with respect to the horizontal surface on which the stack rests, said second light source being positioned at a third position and said third angle being less than the second angle;

a memory for storing intensity values of pixels representing said image information;

a processor for performing mathematical operations on the intensity values stored in the memory to thereby derive the spatial position information.

6,016,369

IMAGE GENERATION METHOD AND APPARATUS

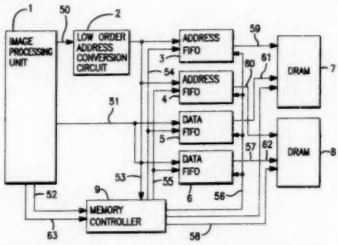
Yasuhiro Koido, and Sanchi Nakayama, both of Kanagawa, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 23, 1997, Appl. No. 997,607

Claims priority, application Japan, Jan. 16, 1997, 9-005373

Int. Cl.[7] G06K *9/32*

U.S. Cl. 382—298 **4 Claims**



1. An image generation method comprising the steps of:

dividing an area of written image into a plurality of rectangular blocks;

subdividing each of said blocks longitudinally and laterally into a plurality of rectangular segments corresponding to pixels of the image;

assigning binary data which represent an address of each pixel as a basic address signal;

bisecting the basic binary data of basic address signal into a high order address signal bits for longitudinal address and a low order address signal bits for the lateral address;

outputting a result of exclusive OR of least significant bits of high and low order address signal bits of basic address signal;

converting the arrangement of pixels by replacing the least significant bit of the low order address signal bits with the outputted result of the exclusive OR;

separating the pixels into two groups according to the value of the least significant bit of the low order address signal bits after the replacement;

storing temporarily the separated pixels with their basic addresses into correspondigly separated FIFOS;

storing the pixels with its basic addresses stored in the FIFOs into two DRAMs separated in accordance with the same separation discrimination mode, sequentially in parallel; and

outputting the pixels stored in the separated DRAMs according to the corresponding basic addresses.

6,016,370

IMAGE DATA PROCESSING APPARATUS HAVING PIXEL QUANTITY CONVERSION AND ERROR DIFFUSION FUNCTIONS

Mitsuaki Hatakeyama, and Kenichi Ohkubo, both of Gifu-ken, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

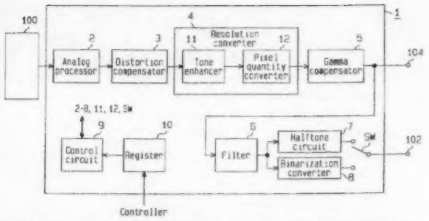
Filed Jul. 8, 1997, Appl. No. 889,720

Claims priority, application Japan, Jul. 9, 1996, 8-179461; Jul. 12, 1996, 8-183360

Int. Cl.[7] G06K *9/32*

U.S. Cl. 382—299 **7 Claims**

1. An apparatus for processing image data corresponding to one screen, said image data consisting of a plurality of lines, each including plural pieces of consecutive analog element data, said apparatus comprising:



an analog processor for quantizing each of said analog element data to generate multiple-state element data;

a quantity converter for successively receiving plural pieces of said multiple-state element data from said analog processor and changing the number of plural pieces of multiple-state element data in one line to generate quantity-converted element data, wherein said quantity converter includes

at least three series-connected resisters for successively temporarily storing said plural pieces of multiple-state element data,

at least two averaging circuits, connected to said at least three registers, each averaging circuit receiving at least two adjacent pieces of multiple-state element data from the associated two registers and computing an average value of said at least two adjacent pieces of multiple-state element data to generate one piece of new multiple-state element data,

at least two first selector circuits, connected to one of said at least three registers and respectively connected to said at least two averaging circuits, each first selector circuit receiving said original multiple-state element data from said one register and said one piece of new multiple-state element data from said associated averaging circuit, said each first selector circuit selectively outputting said one piece of new multiple-state element data and said original multiple-state element data in accordance with a predetermined first select clock, and

a second selector circuit, connected to one of said at least three registers and at least two first selector circuits, for receiving said original multiple-state element data from said one register and at least two pieces of new multiple-state element data from said at least two first selector circuits, said second selector selectively outputting said at least two pieces of new multiple-state element data and said original multiple-state element data as said quantity-converted element data in accordance with a predetermined second select clock; and

a binarization converter for receiving said quantity-converted element data and binarizing said quantity-converted element data to generate binary element data.

6,016,371

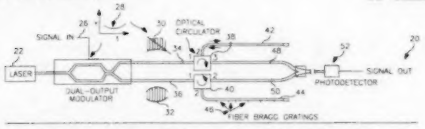
OPTICAL RF SIGNAL PROCESSING

Michael G. Wickham, Rancho Palos Verdes, and Philip H. Wisseman, Hermosa Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 19, 1997, Appl. No. 994,344

Int. Cl.[7] G02B *6/28*

U.S. Cl. 385—10 **33 Claims**



1. An RF optical signal processing system comprising:

a source of an optical carrier;

an optical modulator having an optical input port for receiving said source of an optical carrier and an RF input port for receiving an RF signal, said optical modulator having dual output ports and generating complementary modulated output signals;

one or more tapped delay lines, optically coupled to one or more of said dual output ports of said output modulator;

a pair of output lines, optically coupled to each of said dual output ports of said optical modulator and said one or more tapped delay lines; and

a photodetector which combines the outputs from said pair of output lines.

6,016,372

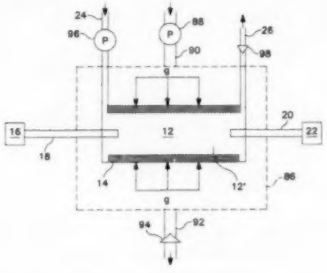
CHEMICAL SENSING TECHNIQUES EMPLOYING LIQUID-CORE OPTICAL FIBERS

Harry Fein, Venice, and Su-Yi Liu, Sarasota, both of Fla., assignors to World Precision Instruments, Inc., Sarasota, Fla.

Continuation-in-part of application No. 08/951,254, Oct. 16, 1997. This application Apr. 6, 1998, Appl. No. 55,865.

Int. Cl.[7] G02B *6/20*

U.S. Cl. 385—12 **21 Claims**



1. A method for the optical detection of a chemical substance comprising the steps of:

filling the core region of a rigid tubular optical waveguide with a liquid which undergoes a change in an optical characteristic thereof upon exposure to a chemical substance of interest, the tubular waveguide being comprised of an optically clear amorphous polymer having a refractive index of less than 1.33, the liquid having an index of refraction which exceeds that of the waveguide, the waveguide being impermeable to the liquid delivered into the core region thereof and being permeable to gas and vapor;

exposing at least a portion of the exterior of the filled waveguide to an ambient environment which may include the chemical substance of interest;

controlling the pressure of the ambient environment to thereby influence the rate of permeation of the chemical substance of interest through the waveguide; and

monitoring a change in an optical characteristic of the core liquid which occurs upon permeation of the chemical substance of interest through a wall of the tubular waveguide.

6,016,373

APPARATUS AND METHOD FOR CONFIGURING A FIBER OPTICAL ASSEMBLY

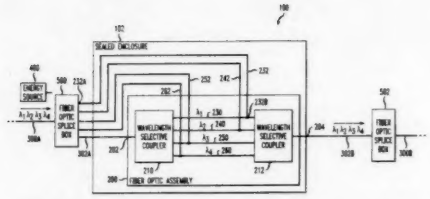
Howard D. Kidorf, 82 Tower Hill Dr., Red Bank, N.J. 07701

Filed Jun. 3, 1997, Appl. No. 867,726

Int. Cl.[7] G02B *6/26*

U.S. Cl. 385—24 **20 Claims**

1. An apparatus for configuring a fiber optic assembly that is contained within a sealed enclosure, wherein the assembly includes a plurality of optical transmission paths and wherein each of the optical transmission paths is able to transmit a signal through the fiber optic assembly, comprising:



a plurality of links wherein each of said links is associated with one of said optical transmission paths and wherein each of said links extends through said sealed enclosure and has a first end located external to said sealed enclosure and a second end located within said sealed enclosure and adjacent to its associated optical transmission path; and

an energy source coupled to a first end of one of said links wherein said energy source inserts energy into one of said links from said first end to said second end of one of said links and wherein the energy from said energy source renders the optical transmission path associated with said one of said links incapable of transmitting a signal through the optical transmission path.

6,016,374

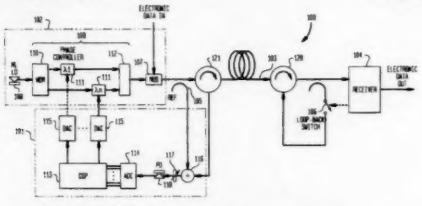
OPTICAL FIBER COMMUNICATIONS SYSTEM WITH ADAPTIVE DATA EQUALIZER

Laura Ellen Adams, Basking Ridge; Young-Kai Chen, Berkeley Heights, both of N.J., and Gerald Nykolak, Long Island, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 4, 1997, Appl. No. 963,893

Int. Cl.[7] G02B *6/28;* **H04B** *10/00;* **H03H** *7/30*

U.S. Cl. 385—24 **6 Claims**



1. An optical fiber communications system comprising:

an optical transmitter for transmitting adaptively equalized optical pulses, said transmitter comprising a source of optical pulses, a plurality of phase controllers for separately controlling the phases of a plurality of spectral components of said pulses, and a modulator for said pulses;

an optical transmission fiber for transmitting optical pulses from said transmitter;

an optical receiver for receiving optical pulses from said fiber;

an optical tap for tapping an optical reference signal indicative of said pulses near said transmitter;

an optical tap for tapping an optical loop back signal indicative of said pulses near said receiver; and

an adaptive equalizer responsive to said optical reference signal and said optical loop back signal for controlling said phase controllers to reduce linear distortion in the received pulses.

6,016,375

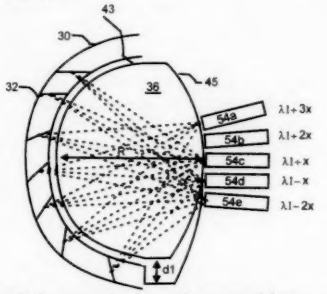
WAVELENGTH SELECTIVE FIBER TO FIBER OPTICAL TAP

Kenneth O. Hill, 1 Binning Court, Kanata, Ontario, Canada, K2K 1B2, and Mark Farries, 26 Tiverton Drive, Nepean, Ontario, Canada, K2E 6L5

Filed Jan. 8, 1997, Appl. No. 780,446

Int. Cl.[7] G02B *6/34*

U.S. Cl. 385—37 **9 Claims**



1. An optical communication system comprising:

a first mono-mode optical waveguide having a grating impressed therein, the grating having refractive index perturbations that reflect predetermined wavelengths of incident light out of a portion of a side of the optical waveguide adjacent the grating; and,

a substantially planar waveguide having a first end optically coupled to the portion of the first mono-mode optical waveguide, for guiding light coupled out of the side of the waveguide, and for maintaining a uni-phase wavefront of said light by having a response that confines the light to a single mode in one dimension, and multi-mode in another dimension and allows at least a portion of the light to converge.

6,016,376

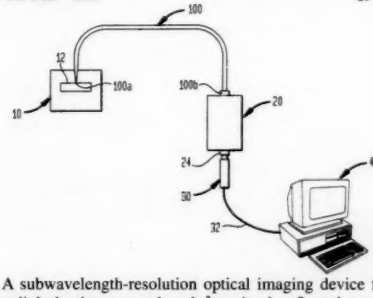
TAPERED COHERENT FIBER BUNDLE IMAGING DEVICE FOR NEAR-FIELD OPTICAL MICROSCOPY

Hadi F. Ghaemi, Princeton; Yao Li, Monmouth Jct.; Tineke Thio, and Ting Wang, both of Princeton, all of N.J., assignors to NEC Research Institute, Inc., Princeton, N.J.

Provisional application No. 60/061,126, Oct. 6, 1997. This application Aug. 31, 1998, Appl. No. 143,670.

Int. Cl.[7] G02B *6/04;* **G01J** *4/00*

U.S. Cl. 385—116 **19 Claims**



1. A subwavelength-resolution optical imaging device for conveying light having a wavelength λ emitted, reflected or transmitted by a sample, the device comprising:

a coherent fiber bundle comprising a plurality of optical fibers disposed substantially coaxially along their lengths, each optical fiber having a first optical fiber end and a second optical fiber end, and each optical fiber comprising a core having an index of refraction n_1 and a cladding having an index of refraction n_2 thereby providing a value Δ, where:

$$\Delta = \sqrt{n_1^2 - n_2^2}$$

and wherein:

the coherent fiber bundle includes an observation end comprising the first optical fiber ends which collectively present an observation end face for at least one of introducing, conveying and emitting the light;

the coherent fiber bundle farther includes a sampling end comprising the second optical fiber ends, each second optical fiber end being of reduced diameter in comparison to the first optical fiber end and tapered to present a sampling end face, the core of each optical fiber at the sampling end face having a cross-sectional diameter which is less than or equal to λ; and

wherein the values of n_1 and n_2 are selected so as to provide a value for Δ which permits at least a predetermined fraction of the light launched into each optical fiber at the sampling end of the coherent fiber bundle to be conveyed through the optical fiber to the observation end of the coherent fiber bundle and which restricts crosstalk between adjacent optical fibers of the coherent fiber bundle to a predetermined level.

6,016,377

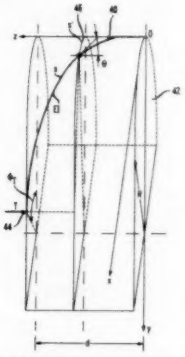
METHOD FOR DETERMINING AND OPTIMIZING THE CURVATURE OF A GLASS FIBER FOR REDUCING FIBER STRESS

Ephraim Suhir, Randolph, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 19, 1997, Appl. No. 994,121

Int. Cl.[7] G02B *6/00*

U.S. Cl. 385—135 **10 Claims**



1. A method for reducing the stress in a fiber by varying the curvature of a fiber disposed on a cylindrical surface, such that first end of the fiber is clamped to said cylindrical surface and the second end of the fiber is moveably fastened to said cylindrical surface, said method comprising the steps of:

extending said fiber around a portion of said cylinder;

providing a fastening element so as to control the location of said second end of the fiber on said cylindrical surface; and

adjusting the curvature of said fiber such that the total curvature κ of said fiber remains substantially constant over the entire length of said fiber.

2. The method in accordance with claim **1**, wherein said step of adjusting further comprises the step of locating said fastening element such that

$$s' = d - R\arctan\left[\tan\left[\frac{d}{R}\right]\sqrt{1 - \frac{\sin^2\left[\frac{z}{R}\right]}{\sin^2\left[\frac{d}{R}\right]}}\right]$$

wherein z is the longitudinal coordinate parallel with the longitudinal axis of said cylindrical surface such that at the point wherein said first end is clamped z=0, s' is the curvilinear coordinate of the fiber measured as a portion of a circumference that intersects said z coordinate and said fiber, d is the distance measured along the z coordinate between said first end to said second end of said fiber, and R is the radius of said cylinder surface.

6,016,378

ADAPTABLE ASSEMBLY OF STACKED AND HINGED FLAT MODULES

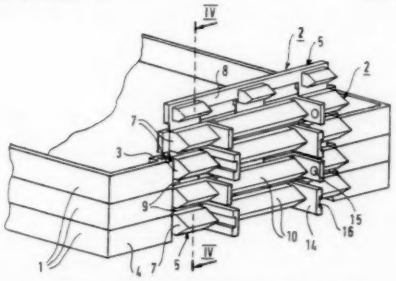
Christian Cuny, Marolles En Hurepoix, and Alain Vincent, Juilly, both of France, assignors to Alcatel, Paris, France

Filed Mar. 16, 1998, Appl. No. 39,234

Claims priority, application France, Mar. 17, 1997, 97 03179

Int. Cl.[7] G02B *6/00*

U.S. Cl. 385—135 **10 Claims**



1. A modular assembly of hinged stacked flat modules comprising n substantially identical modules and a support for holding said modules and to which they are hinged, where n is an integer greater than 1, said modules have two larger stacking faces and smaller peripheral faces and first retaining means on a first of their smaller faces, and said support has a length at least equal to the height of said stacked modules and includes successive and non-contiguously superposed elementary parts, hinges between them, second retaining means complementary to said first retaining means on each of them for holding one of the modules on an assembly face of each elementary part, abutments projecting from the face opposite the assembly face of the elementary parts, and at least one modular support having one of said elementary parts at a first end and a truncated additional part at its opposite second end, said truncated additional part being engageable in the elementary part of said first end of another identical modular support.

6,016,379

METHOD AND FACILITY FOR EQUALIZING AN ELECTRIC SIGNAL DISTORTED DUE TO INTERFERENCE IN THE OPTICAL DOMAIN

Henning Bülow, Stuttgart, Germany, assignor to Alcatel, Paris, France

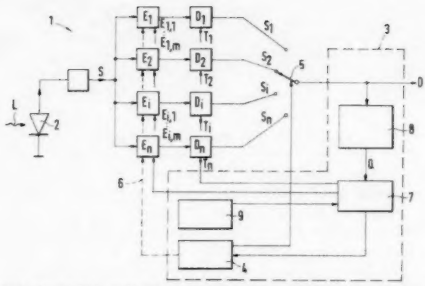
Filed Jul. 31, 1998, Appl. No. 127,475

Claims priority, application Germany, Aug. 5, 1997, 197 33 764

Int. Cl.[7] G02B *6/00*

U.S. Cl. 385—147 **13 Claims**

6. An electrical equalizing facility for an electric input signal (S) which was derived from an optical signal (L) transmitted over an optical waveguide and which is distorted due to interference in the



optical signal (L), said electrical equalizing facility comprising an electronic equalizer, characterized by a number (n>1) of parallel-connected, different, variable electronic equalizers (E_1, . . . , E_i, . . . , E_n) to which the electric input signal (S) is applied, and by a control unit (3) for selecting the electric output signal (S_i) of the respective best equalizing electronic equalizer (E_i) and for controlling the equalization parameters ($E_{i,1}$, . . . , $E_{i,m}$) of said best equalizing electronic equalizer in such a way that the quality (Q) of its equalized output signal (S_i) is optimized.

6,016,380

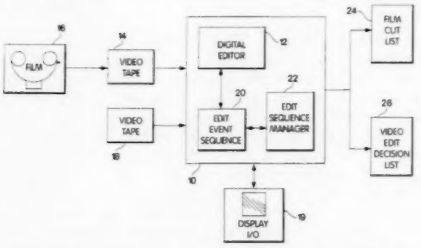
TEMPLATE-BASED EDIT DECISION LIST MANAGEMENT SYSTEM

Mark J. Norton, Bedford, Mass., assignor to Avid Technology, Inc., Tewksbury, Mass.

Filed Sep. 24, 1992, Appl. No. 950,787

Int. Cl.[7] H04N *5/76*

U.S. Cl. 386—52 **38 Claims**



1. A computer system for generating a video edit decision list comprising a formatted list of computer instructions for an edit controller for assembling a video program, wherein each instruction defines source material and a destination of a video editing event, the computer system comprising:

input means for receiving a representation of the video program as a sequence of edit events produced by a digital video editing system,

selecting means, connected to the input means, for selecting one of a plurality of video edit decision list format specifiers, wherein each format specifier specifies a syntax of a video edit decision list of a different machine,

generating means for generating, according to the sequence of edit events, the formatted list of computer instructions in the syntax specified by the selected video edit decision list format specifier, and

output means, connected to the selecting means, for outputting the formatted list as the video edit decision list for use by the edit controller for assembling the video program.

6,016,381

APPARATUS FOR REPRODUCING INFORMATION

Kazuhiko Taira; Shinichi Kikuchi; Tomoaki Kurano; Hideki Mimura, and Takeshi Hagio, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

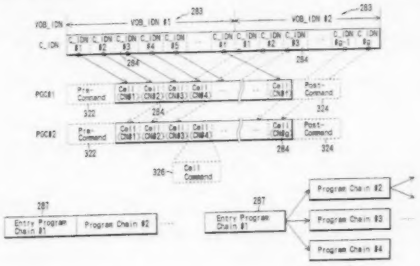
Division of application No. 08/631,436, Apr. 12, 1996. This application Sep. 17, 1997, Appl. No. 932,910.

Claims priority, application Japan, Apr. 14, 1995, 7-114017

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04N *5/76*

U.S. Cl. 386—95 **15 Claims**



1. An apparatus for reproducing video data cells from a recording medium having a data area, wherein said data area includes a video object to be reproduced and a program chain information table for defining at least two program chains each of which is specified by a program chain number, wherein

said video object has an arrangement of video data cells, each cell being composed of video object units, and each video object unit composed of a sequence of data packs, the sequence of the data packs including a combination of at least one video, audio and sub-picture packs and a navigation pack placed at the head of the sequence,

each of the video, audio and sub-picture packs includes a pack header and a packet of encoded video, audio or sub-picture data, and the navigation pack includes a pack header, a first packet for storing a first control information of presenting the video object units and second packet for storing a second control information of searching the video object units, and

said program chain information table includes program chain information items associated with respective said program chains and search pointers corresponding to the program chain numbers, for searching the corresponding program chain items, respectively, said each of said program chain information items comprising:

(1) cell playback information specifying a playback order of said video data cells in an associated program chain, each cell being defined by start addresses of the first and last video object units in the corresponding cells,

(2) content information describing the number of cells in said associated program chain; and

(3) program chain navigational control information comprising:

(a) previous program chain information indicative of whether there exists a program chain that precedes said associated program chain during reproduction of said program chains from said recording medium,

(b) a previous program chain number specifying said program chain preceding said associated program chain, if said program chain preceding said associated program chain exists,

(c) next program chain information indicative of whether there exists a program chain that follows said associated program chain during reproduction of said program chains from said recording medium,

(d) a next program chain number specifying said program chain following said associated program chain, if said program chain following said associated program chain exists,

(e) GoUp program chain information indicative of whether there exists a GoUp program chain that can be reproduced instead of continuing to reproduce said associated program chain; and

(f) a GoUp program chain number specifying said GoUp program chain, if said GoUp program chain exists,

said apparatus comprising:

(A) means for searching said program chain information table for said program chain information item corresponding one of said program chains and acquiring said video data cells constituting said one of said program chains with reference to said cell playback information in said program chain information item;

(B) means for storing said program chain information item in said program chain information table;

(C) means for transferring said video object units in said acquired video data cells and converting said video audio and sub-picture packs into video, audio and sub-picture signals;

(D) means for indicating a link of another one of said program chains; and

(E) means for referring said stored program chain navigation control information in said stored program chain information item in response to the link indication, checking the existence of said another one program chain, and linking said one program chain to said another one program chain, if said another one program chain exists.

6,016,382

METHOD FOR JUMP-REPRODUCING VIDEO DATA OF MOVING PICTURE CODED WITH HIGH EFFICIENCY

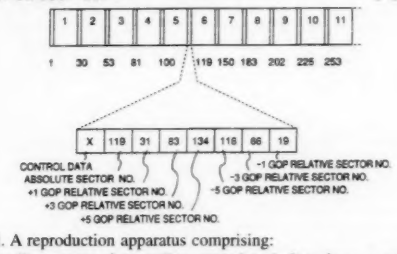
Toru Yamagishi; Ken Miyazaki, and Kentaro Yokouchi, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Division of application No. 08/213,805, Mar. 16, 1994, Pat. No. 5,535,008. This application Jun. 13, 1996, Appl. No. 662,920.

Claims priority, application Japan, Mar. 16, 1993, 5-81327; Mar. 17, 1993, 5-82782; Jan. 14, 1994, 6-16008

Int. Cl.[7] H04N *5/917*

U.S. Cl. 386—109 **6 Claims**


1 2 3 4 5 6 7 8 9 10 11
1 30 53 81 100 119 150 183 202 225 253
X 119 31 83 134 116 66 19
CONTROL DATA
ABSOLUTE SECTOR NO.
+1 GOP RELATIVE SECTOR NO.
+3 GOP RELATIVE SECTOR NO.
+5 GOP RELATIVE SECTOR NO.
-1 GOP RELATIVE SECTOR NO.
-3 GOP RELATIVE SECTOR NO.
-5 GOP RELATIVE SECTOR NO.

1. A reproduction apparatus comprising:

reading means for reading reproduced data from a rotating storage medium on which moving picture data coded with a highly efficient coding method is recorded in such a way that a plurality of front and/or rear positional data are recorded in front of a first independently decodable independent frame that constitutes a part of the moving picture data, the front and/or rear positional data being related to recorded positions of second independently decodable independent frames constituting other parts of the moving picture data and recorded before and/or after the first independently decodable independent frame, the front and/or rear positional data being used for a special reproduction mode, the front and/or rear positional data being recorded as relative addresses and/or absolute addresses;

detecting means for detecting the front and/or rear positional data from the data outputted by the reading means;

control means for controlling the reading means for access from the first independent frame to one of the second independent frames in the special reproduction mode in accordance with the detected front and/or rear positional data, the second independent frame being not directly accessed after the first independent frame has been read, access from the first to the second independent frame, being performed in order of at least one intermediate independent frame and the second independent frame said intermediate independent frame being located between the first and the second independent frame, access from the first to the intermediate independent frame being carried out on the basis of the front and/or rear positional data recorded in front of the first independent frame the second independent frame being accessed on the basis of the front and/or rear positional data recorded in front of the first independent frame;

storing means for storing at least the moving picture data of the second independent frame read from the storage medium by the reading means, but not storing the moving picture data of the intermediate independent frame; and

decoding means for reading the moving picture data from the storing means and decoding the read moving picture data to output decoded moving picture data, the decoding means outputting only the second independent frames in the special reproduction mode.

6,016,383

RAPID THERMAL HEATING APPARATUS AND METHOD INCLUDING AN INFRARED CAMERA TO MEASURE SUBSTRATE TEMPERATURE

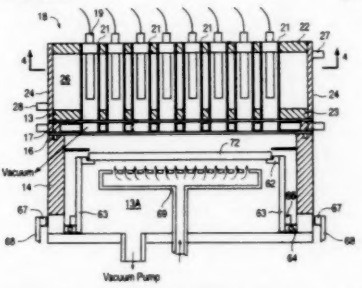
Christian M. Gronet, and James F. Gibbons, both of Palo Alto, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of application No. 08/508,638, Jul. 28, 1995, which is a division of application No. 08/131,830, Oct. 5, 1993, Pat. No. 5,487,127, which is a division of application No. 07/882,656, May 13, 1992, Pat. No. 5,317,492, which is a division of application No. 07/781,632, Oct. 24, 1991, Pat. No. 5,155,336, which is a continuation of application No. 07/467,808, Jan. 19, 1990. This application Feb. 27, 1998, Appl. No. 32,251.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A21B *2/00*

U.S. Cl. 392—416 **8 Claims**



1. An apparatus to measure a temperature across a substrate during rapid thermal processing of the substrate, comprising:

a process chamber having a window;

a plurality of radiant energy sources disposed outside of said chamber and positioned adjacent to said window, said radiant energy sources having a central longitudinal axis that extends in a substantially perpendicular direction relative to said window;

reflectors associated with said radiant energy sources to direct radiant energy through said window to radiate predetermined regions of the substrate in said chamber with a pattern of radiation intensity, said reflectors extending along a major portion of said longitudinal axis of said radiant energy sources, and said radiant energy sources and said reflectors positioned so that a portion of one of said predetermined regions radiated by one of said radiant energy sources over-

laps a portion of a predetermined region radiated by another one of said radiant energy sources to provide a radiation intensity across the substrate that is dependent upon the intensity of each of said radiant energy sources;

an infrared camera located outside of said chamber to image the substrate to sense infrared radiation emitted from the different regions of the substrate and to output a signal representative thereof; and

a computer to receive said signal and programmed to control the intensity of said radiant energy sources to thereby control the temperature of the different regions of the substrate.

6,016,384

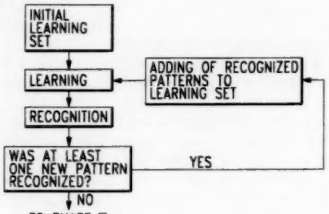
METHOD FOR SPEEDING UP THE CONVERGENCE OF THE BACK-PROPAGATION ALGORITHM APPLIED TO REALIZE THE LEARNING PROCESS IN A NEURAL NETWORK OF THE MULTILAYER PERCEPTRON TYPE

Girolamo Gallo, Foggia, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application No. 07/872,778, Apr. 23, 1992, abandoned. This application Feb. 28, 1995, Appl. No. 396,361. Claims priority, application Italy, May 7, 1991, RM91A0302

Int. Cl.[7] **G06F** *15/18*

U.S. Cl. 395—23 **9 Claims**



1. A learning method for developing patterns to be incorporated into a neural network of the multi-layer perceptron type intended to recognize a set of sample patterns in which back-propagation is relied upon to change network weights during training, wherein convergence as between input patterns to be recognized and existing patterns of the neural network is speeded up, said learning method comprising:

increasing the learning capability of the neural network in a first stage by:

extracting an initial set of patterns as a selected subset from a set of patterns making up the complete learning set of patterns to be processed during a training phase, and providing the initial set of patterns to the neural network,

operating on the complete learning set of patterns including the initial set of patterns as provided to the neural network in accordance with a learning program,

progressively adding new patterns to the initial set of patterns as the new patterns are recognized by the neural network,

reiterating the operation of the learning program on the complete learning set of patterns,

further adding new patterns as recognized to the subset of the previously recognized patterns as defined by the initial set of patterns and all new recognized patterns as added thereto, and

repeating the iteration of the operation of the learning program and the adding of new patterns as recognized to the subset of the previously recognized patterns until no new patterns are recognized by the neural network in completing the first stage of the learning method;

increasing the learning capability of the neural network in a second stage by progressively adding previously unrecognized patterns to the subset of previously recognized patterns as the previously unrecognized patterns are recognized; and

increasing the learning capability of the neural network in a third stage by progressively corrupting unrecognized patterns in the assimilation of such unrecognized patterns with previously recognized patterns until the corrupted unrecognized patterns are recognized and then progressively adding the corrupted unrecognized patterns as recognized to the subset of previously recognized patterns.

6,016,385

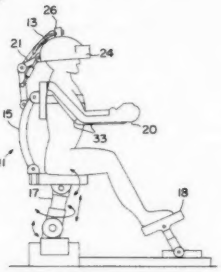
REAL TIME REMOTELY CONTROLLED ROBOT

Albert G. Yee, Union City, Calif., and Hadi A. Akeel, Rochester Hills, Mich., assignors to Fanu America Corp, Union City, Calif.

Filed Aug. 11, 1997, Appl. No. 905,016

Int. Cl.[7] **G05B** *15/00*

U.S. Cl. 395—80 **25 Claims**



1. A robot system which comprises:

a robot means, adapted for being located in a robot environment, for performing tasks in response to control signals received by said robot means;

said robot means including means for generating sensation signals responsive to said robot environment and robot control means for controlling said robot means;

command means adapted for being located in a command environment remote from said robot environment, for generating command signals responsive to a position and movement pattern of an operator;

communication means for receiving said command signals, converting said command signals to said control signals, and transmitting said control signals to said robot means to control said robot to substantially duplicate motion of said pattern;

said robot control means being receptive to said control signals;

said communication means including means for converting said sensation signals to sensation causing effects detectable by said operator.

6,016,386

IMAGE FORMING SYSTEM FOR PREPARING SUBSEQUENT COPIES QUICKLY

Takefumi Nosaki, Odawara, and Toshiharu Takahashi, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of application No. 08/407,104, Mar. 17, 1995, abandoned. This application Jul. 15, 1997, Appl. No. 893,118. Claims priority, application Japan, Mar. 31, 1994, 6-085551

Int. Cl.[7] **H04N** *1/00*

U.S. Cl. 395—114 **14 Claims**

1. An image forming system comprising:

means for receiving code data of pages of a document from an external device;

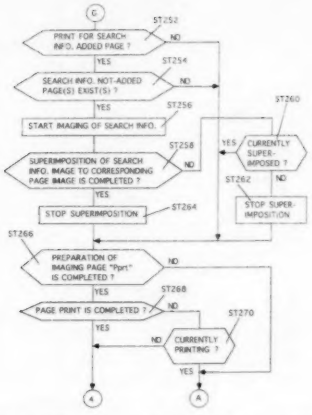
means for converting the code data into corresponding image data of the pages of the document;

means for adding predetermined search information to the image data, the search information being common to each of the pages of the document;

means for printing out the image data together with a visible image of the search information on a printing medium;

means for compressing the image data into compressed image data;

means for storing the compressed image data;



means for inputting the search information recognized by an operator on the printing medium and a request of the operator that one or more prints of the code data are produced;

means for reading out the corresponding compressed image data from said storing means in accordance with the search information and the request of said inputting means;

means for expanding the read out compressed image data to provide expanded image data;

means for superimposing the search information to each of the pages of the expanded image data on which the search information has not been superimposed; and

means for forming all pages of the image with the search information on one or more print media using the expanded image data in order to obtain the prints of a number being requested by said inputting means.

6,016,387

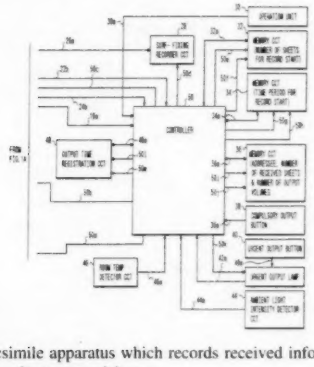
FACSIMILE RECORDING APPARATUS AND METHOD WHICH STORES RECEIVED INFORMATION AND RECORDS WHEN THE AMOUNT OF STORED INFORMATION REACHES A PREDETERMINED VALUE

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/351,648, Dec. 7, 1994, abandoned. This application Jun. 12, 1997, Appl. No. 873,713. Claims priority, application Japan, Dec. 10, 1993, 5-341273

Int. Cl.[7] **H04N** *1/32*

U.S. Cl. 395—115 **34 Claims**



1. A facsimile apparatus which records received information on a recording sheet, comprising:

recording means for recording the received information on the recording sheet, said recording means having an active mode and a standby mode using less electric power than the active mode;

storing means for, with said recording means in the standby mode, storing the received information without recording it by said recording means;

detecting means for detecting an amount of time that has elapsed starting from a first reception time of the received information; and

control means for changing a mode of said recording means from the standby mode to the active mode to cause said recording means to record the stored information, in accordance with a detection by said detecting means.

6,016,388

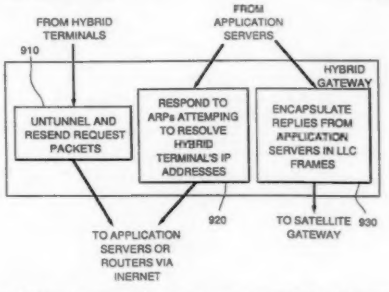
METHOD AND APPARATUS FOR REQUESTING AND RETRIEVING INFORMATION FROM A SOURCE COMPUTER USING TERRESTRIAL AND SATELLITE INTERFACES

Douglas M. Dillon, Gaithersburg, Md., assignor to Hughes Electronics Corporation, El Segundo, Calif.

Division of application No. 08/901,152, Jul. 28, 1997, which is a continuation of application No. 08/257,670, Jun. 8, 1994, abandoned. This application May 6, 1998, Appl. No. 72,992.

Int. Cl.[7] **H04L** *11/20*; **G06F** *13/14*;*13/40*

U.S. Cl. 395—200.72 **20 Claims**


FROM HYBRID TERMINALS
910
FROM APPLICATION SERVERS
HYBRID GATEWAY
UNTUNNEL AND RESEND REQUEST PACKETS
RESPOND TO ARPs ATTEMPING TO RESOLVE HYBRID TERMINAL'S IP ADDRESSES
ENCAPSULATE REPLIES FROM APPLICATION SERVERS IN LLC FRAMES
920
TO SATELLITE GATEWAY
930
TO APPLICATION SERVERS OR ROUTERS VIA INERNET

1. A device for use with an apparatus comprising (a) a port for connecting the apparatus to the internet via a modem and an internet service provider, wherein the apparatus has an IP address which is associated with connection to the internet via the port, (b) an interface for connecting the apparatus to a link having a higher speed than the modem, wherein the apparatus has another IP address which is associated with the interface, and (c) means for generating a request from the apparatus to a destination apparatus on the internet, the request comprising an IP packet wherein the source IP address is the IP address associated with the interface and the destination IP address is the IP address of the destination apparatus on the internet, said device comprising:

a driver for encapsulating the IP packet of the request in an encapsulating IP packet wherein the source IP address is the IP address associated with connection to the internet via the port and the destination address is the IP address of a gateway apparatus which is coupled with both the internet and the link, and for transmitting the encapsulating IP packet to the gateway apparatus by way of the port and the internet service provider, wherein the gateway apparatus unencapsulates the IP packet of the request from the encapsulating IP packet and transmits the IP packet of the request to the destination apparatus on the internet which replies to the IP address associated with the interface via the gateway apparatus and the link.

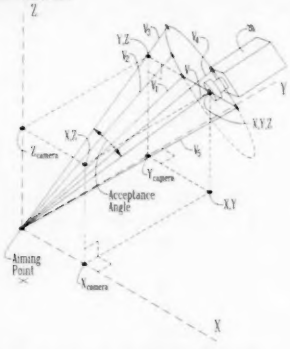
6,016,389
APPARATUS AND METHOD FOR LIGHTING LARGE AREAS FOR TELEVISION

Joe P. Crookham, Oskaloosa, Iowa; William E. Brackett, Boulder, Colo.; Mark A. DeJong, Albia, and David L. Barker, Ottumwa, both of Iowa, assignors to Musco Corporation, Oskaloosa, Iowa

Provisional application No. 60/017,494, May 9, 1996. This application May 8, 1997, Appl. No. 854,012.

Int. Cl.[7] **G06F** *9/455*

U.S. Cl. 395—500.01 **27 Claims**



1. A method of improving television lighting of a target area, comprising:

obtaining television foot-candle readings for a plurality of camera aiming points on the target area;

obtaining vertical foot-candle readings for the same plurality of aiming points on the target area;

calculating the ratio of the television foot-candle and vertical foot-candle readings for each aiming point;

reporting for each aiming point the television foot-candle, vertical foot-candle, and ratio; and

based on the report, determining whether to adjust any of the following: a camera's position, a camera's operating characteristics, a camera's aiming, or lighting.

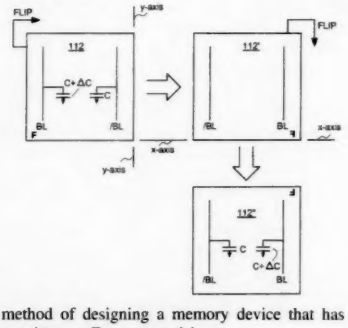
6,016,390
METHOD AND APPARATUS FOR ELIMINATING BITLINE VOLTAGE OFFSETS IN MEMORY DEVICES

James C. Mali, Sunnyvale, and Scott T. Becker, San Jose, both of Calif., assignors to Artisan Components, Inc., Sunnyvale, Calif.

Filed Jan. 29, 1998, Appl. No. 15,427

Int. Cl.[7] **G11C** *11/407*

U.S. Cl. 395—500.18 **29 Claims**



1. A method of designing a memory device that has reduced bitline capacitance offsets; comprising:

providing a memory core having a depth that defines a plurality of words, and a word width that is defined by multiple pairs of a global bitline and a global complementary bitline;

designing a six transistor core cell having a bitline and a complementary bitline;

designing a flipped six transistor core cell that has a flipped bitline and a flipped complementary bitline; and

arranging a six transistor core cell followed by a flipped six transistor core cell along each of the multiple pairs of the global bitline and the global complementary bitline.

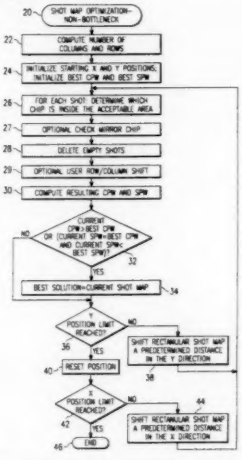
6,016,391
APPARATUS AND METHOD FOR OPTIMIZING INTEGRATED CIRCUIT FABRICATION

Angelo Facchini, Rieti, and Antonio Serapiglia, L'Aquila, both of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1997, Appl. No. 999,436

Int. Cl.[7] **G06F** *17/50;19/00;* **G03F** *9/02*

U.S. Cl. 395—500.22 **24 Claims**



1. A computerized method for generating an optimal shot map layout, comprising the steps of:

generating an initial rectangular shot map having a number of rows and columns of shots;

determining which chips in the initial rectangular shot map are geometrically positioned on acceptable areas of a wafer;

determining which chips in the initial rectangular shot map are geometrically positioned on low and high yield locations of the wafer;

deleting shots from the initial rectangular shot map not geometrically positioned on acceptable areas of the wafer for obtaining a temporary best shot map;

iteratively shifting the initial rectangular shot map along a first axis until a first predetermined limit is reached, comparing each resultant shifted shot map with the temporary best shot map, and setting the shifted shot map as the temporary best shot map in response to a favorable comparison;

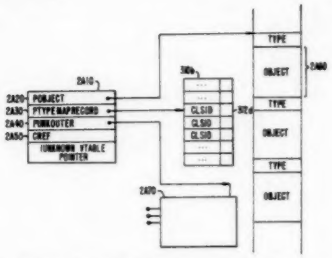
iteratively shifting the initial rectangular shot map along a second axis until a second predetermined limit is reached, comparing each resultant shifted shot map with the temporary best shot map, and setting the shifted shot map as the temporary best shot map in response to a favorable comparison; and

generating a best shot map for wafer fabrication.

6,016,392
METHOD FOR OBJECT-ORIENTED PROGRAMMING USING DYNAMIC INTERFACES

David A Jordan, Madison, Ala., assignor to Intergraph Corporation, Huntsville, Ala.

Filed Nov. 3, 1995, Appl. No. 552,812
Int. Cl.[7] G06F *9/40*
U.S. Cl. 395—682 25 Claims



1. In a software application in a computer system, a method for allocating memory for a COM-compliant object, the method comprising:

maintaining a first static data structure storing information for supported by the computer system, the classes including a class of the COM-complaint object;

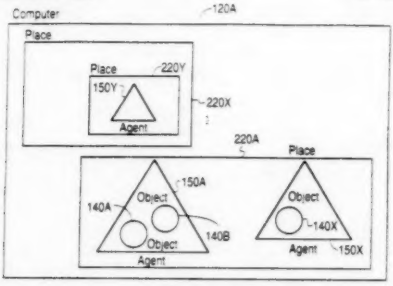
maintaining a second static data structure storing information for interfaces for each of the classes supported by the computer system, the second static data structure comprising for each interface, a first memory location storing an interface identifier identifying the interface and a second memory location storing a location of a table of functions implementing the interface; and

dynamically allocating memory for the COM-compliant object belonging to one of the classes supported by the computer system, without allocating a pointer for each of the interfaces supported by the COM-compliant object.

6,016,393
SYSTEM AND METHOD FOR DISTRIBUTED COMPUTATION BASED UPON THE MOVEMENT, EXECUTION, AND INTERACTION OF PROCESSES IN A NETWORK

James E. White, San Carlos; Christopher S. Helgeson, and Douglas A. Steedman, both of Mountain View, all of Calif., assignors to General Magic, Inc., Sunnyvale, Calif.

Continuation of application No. 08/090,521, Jul. 8, 1993, Pat. No. 5,603,031. This application Feb. 10, 1997, Appl. No. 798,675.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] G06F *13/00*
U.S. Cl. 395—683 15 Claims



1. In a heterogeneous computer network having one or more computers, a method for transferring objects from a first computer to a second computer, said method comprising:

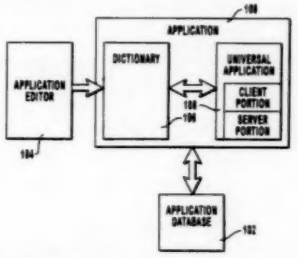
(a) executing a process on said first computer wherein said process comprises instructions from a computer instruction set and said process owns an object; and

(b) transferring said object to said second computer in response to an instruction in said instructions so that said object can be utilized on said second computer.

6,016,394
METHOD AND SYSTEM FOR DATABASE APPLICATION SOFTWARE CREATION REQUIRING MINIMAL PROGRAMMING

Jeffrey L. Walker, Ross, Calif., assignor to TenFold Corporation, Draper, Utah

Filed Sep. 17, 1997, Appl. No. 932,255
Int. Cl.[7] G06F *9/445*
U.S. Cl. 395—701 27 Claims



1. A method for computer-assisted database management software creation of a target software application from a universal software application, said target software application for use in interacting with an application database, said method comprising the steps of:

a) facilitating a high-level dialog via an application editor to derive a description representing a customization of said universal software application into said target software application;

b) storing said description of said target software application in a dictionary, said dictionary to be accessed by said universal software application; and

c) invoking said dictionary by said universal software application upon execution of said target software application to customize said universal software application as said target software application.

6,016,395
PROGRAMMING A VECTOR PROCESSOR AND PARALLEL PROGRAMMING OF AN ASYMMETRIC DUAL MULTIPROCESSOR COMPRISED OF A VECTOR PROCESSOR AND A RISC PROCESSOR

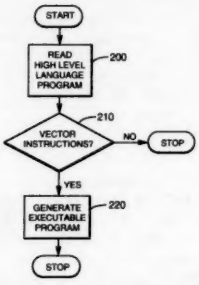
Moataz Ali Mohamed, Santa Clara, Calif., assignor to Samsung Electronics Co., Ltd., Chung-Ku, Rep. of Korea

Filed Oct. 18, 1996, Appl. No. 731,455
Int. Cl.[7] G06F *9/45*
U.S. Cl. 395—705 35 Claims

1. A method for creating a computer program on a computer readable media for execution by a vector processor, the method comprising:

a computer system reading a computer program written in a superset of C programming language, wherein the C programming language defines a plurality of operations and does not specify for each operation in said plurality how the operation is to be implemented in the vector processor, the computer program further including:

a declaration of a value having a vector type, the vector type being part of a programming model of the vector processor, the vector type being distinct from an array type included in the C programming language; and



a first operation having the vector type value as an operand, the first operation corresponding to a vector processor instruction VPI1 that can be executed by the vector processor and that has at least a vector operand; and

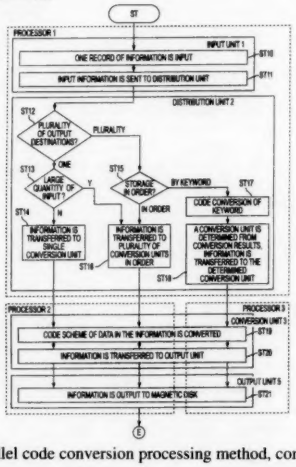
the computer system generating one or more vector processor instructions that together implement the first operation, the one or more instructions including one or more VPI1 instructions.

6,016,396

PARALLEL CODE CONVERSION PROCESSING METHOD AND PARALLEL CODE CONVERSION PROCESSING SYSTEM

Tomoaki Mochizuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 8, 1995, Appl. No. 555,137
Claims priority, application Japan, Nov. 8, 1994, 6-273852
Int. Cl.[7] G06F *5/00*
U.S. Cl. 395—706 **26 Claims**



1. A parallel code conversion processing method, comprising the steps of:

dividing character code information into plural pieces, the character code information representing a predetermined set of data arranged in an input order and encoded according to a first code scheme used in a first computer system;

transferring the plural pieces of character code information respectively to a plurality of processing units; and

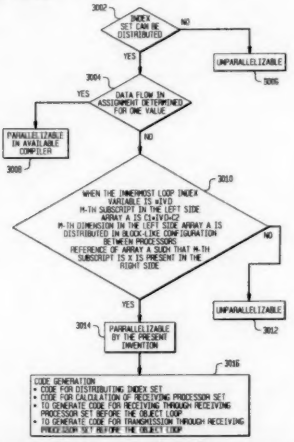
converting the character code information from the first code scheme into a second code scheme used in a second computer system by converting the plural pieces of the character code information in parallel on the respective processing units to generate plural pieces of converted character code information representing the predetermined set of data encoded according to the second code scheme.

6,016,397

METHOD AND APPARATUS FOR COMPILATION OF A DATA PARALLEL LANGUAGE

Takeshi Ogasawara, Setagaya-ku, and Hideaki Komats, Yokohama, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1995, Appl. No. 570,996
Claims priority, application Japan, Dec. 15, 1994, 6-311764
Int. Cl.[7] G06F *9/06*
U.S. Cl. 395—706 **33 Claims**


3002
INDEX SET CAN BE DISTRIBUTED
NO
YES
UNPARALLELIZABLE
3005
3004
YES
DATA FLOW IN ASSIGNMENT DETERMINED FOR ONE VALUE
PARALLELIZABLE IN AVAILABLE COMPILER
3008
NO
3010
WHEN THE INNERMOST LOOP INDEX VARIABLE IS K(V2)
M-TH SUBSCRIPT IN THE LEFT SIDE ARRAY A IS C1+1*(V2-C2)
M-TH DIMENSION IN THE LEFT SIDE ARRAY A IS DISTRIBUTED IN BLOCK-LIKE CONFIGURATION BETWEEN PROCESSORS
REFERENCE OF ARRAY A SUCH THAT M-TH SUBSCRIPT IS K IS PRESENT IN THE RIGHT SIDE
NO
YES
UNPARALLELIZABLE
3012
3014
PARALLELIZABLE BY THE PRESENT INVENTION
3016
CODE GENERATION
• CODE FOR DISTRIBUTING INDEX SET
• CODE FOR CALCULATION OF RECEIVING PROCESSOR SET
• TO GENERATE CODE FOR RECEIVING THROUGH RECEIVING PROCESSOR SET BEFORE THE OBJECT LOOP
• TO GENERATE CODE FOR TRANSMISSION THROUGH RECEIVING PROCESSOR SET BEFORE THE OBJECT LOOP

1. In a computer having a plurality of processors, a method for generating code in a compiler by dividing loops in a source program among said plurality of processors so as to execute said loops in parallel, said method comprising the steps of:

(a) reading said source program;

(b) locating a loop wherein an index set associated with said loop can be distributed among said plurality of processors and wherein data dependency of a right side of an assignment expression within said loop is indefinite;

(c) distributing the index set associated with said loop located at step (b) among said plurality of processors;

(d) for said loop located in step (b), if an index variable associated with said loop is an internal loop index iteration variable of a nested loop determining at least one condition relating to said assignment expression;

(e) calculating a receiving processor set in accordance with the determination made in step (d); and

(f) generating code for communicating data to said receiving processor set in accordance with the receiving processor set calculated in step (e).

6,016,398

METHOD FOR USING STATIC SINGLE ASSIGNMENT TO COLOR OUT ARTIFICIAL REGISTER DEPENDENCIES

Jim J. Radigan, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

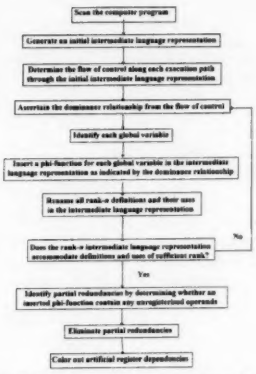
Filed Apr. 1, 1997, Appl. No. 831,739
Int. Cl.[7] G06F *9/45*
U.S. Cl. 395—709 **22 Claims**

1. A method of using static single assignment to color out artificial register dependencies while compiling at least a portion of a computer program, the method comprising:

creating a rank-n SSA intermediate language representation of the computer program, wherein n is a positive integer greater than 0, to assign a unique name to each symbolic expression;

mapping the symbolic expression into a table;

determining from the table which renamed elements from the intermediate language expression have symbolic expressions that are equivalent, by utilizing a hash function; and


Scan the composite program
Generate an initial intermediate language representation
Determine the flow of control along each execution path through the initial intermediate language representation
Ascertain the dominance relationship from the flow of control
Identify each global variable
Insert a phi-function for each global variable in the intermediate language representation as indicated by the dominance relationship
Rename all rank-o definitions and their uses in the intermediate language representation
Does the rank-o intermediate language representation accommodate definitions and uses of sufficient rank?
No
Yes
Identify partial redundancies by determining whether an inserted phi-function contains any unregistered operands
Eliminate partial redundancies
Color out artificial register dependencies

coloring out an artificial register dependency based on equivalent symbolic expressions.

6,016,399

SOFTWARE PIPELINING A HYPERBLOCK LOOP

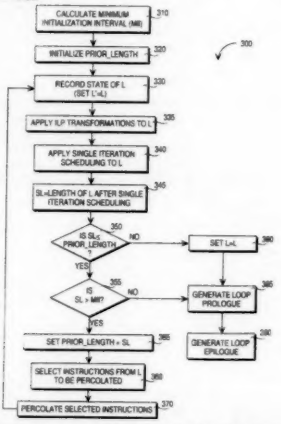
Pohua Chang, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of application No. 08/630,858, Mar. 28, 1996, Pat. No. 5,920,724. This application Dec. 16, 1998, Appl. No. 212,549.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *9/45;9/44*

U.S. Cl. 395—709 **27 Claims**



1. A machine-readable medium having stored thereon sequences of instructions that when executed by a processor cause the processor to:

a) compute a minimum initiation interval of a program loop having a single control flow entry and at least one control flow exit;

b) apply instruction level parallelism transformations on the program loop;

c) apply single iteration scheduling on the program loop;

d) percolate selected instructions to a prior iteration of the program loop to generate a new instruction order for the program loop;

e) repeat b) through d) as long as a previous single iteration length of the program loop is greater than or equal to a current single iteration schedule length of the program loop and the current single iteration schedule length exceeds the minimum initiation interval.

6,016,400

PRELOADING SOFTWARE ONTO A COMPUTER SYSTEM

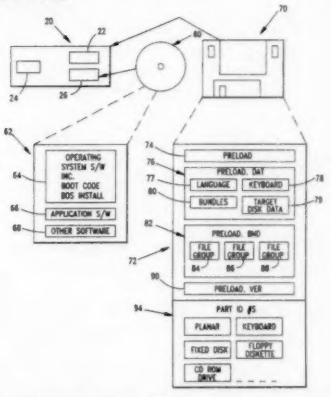
Michael Norman Day, Round Rock, Tex.; Jesse Charles Frye, Raleigh, N.C.; Aylwin Yim Seen, Austin, Tex., and Philip McArthur Simpson, Wemyss Bay, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1996, Appl. No. 770,027

Claims priority, application United Kingdom, Jan. 11, 1996, 9600534

Int. Cl.[7] G06F *9/445*

U.S. Cl. 395—712 **9 Claims**



1. A method for preloading software onto a computer system as part of the system assembly process, the computer system when assembled including a bootable optical disk drive, a mass storage medium for storing operating system and application software, and a diskette drive, the method comprising:

loading a removable optical storage medium into the optical disk drive, the optical storage medium having stored thereon a plurality of items of computer software;

loading a removable manufacturing diskette into the diskette drive, the manufacturing diskette having stored thereon customized installation files defining which of the items of computer software stored on the optical storage medium are to be installed on the mass storage medium of the computer system, the manufacturing diskette further including additional data employed during other steps of the manufacture of the computer system; and

booting the computer system from the loaded optical storage medium and loading, from the optical storage medium, the items of software defined by the installation files on the manufacturing diskette.

6,016,401

HIGH SPEED NETWORK INTERFACE HAVING SAR PLUS PHYSICAL INTERFACE

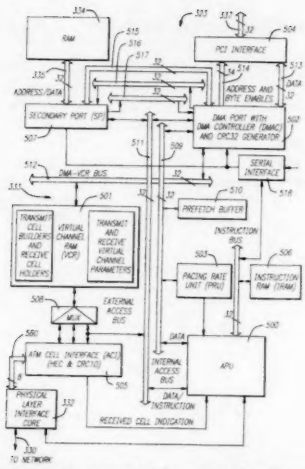
Michael D. Rostoker, Boulder Creek; John P. Daane, Saratoga; Sanjay Desai, Sunnyvale, and D. Tony Stelliga, Pleasanton, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of application No. 08/753,255, Nov. 21, 1996, abandoned, which is a continuation of application No. 08/488,249, Jun. 7, 1995, which is a continuation of application No. 08/412,863, Mar. 28, 1995, which is a continuation-in-part of application No. 08/389,601, Feb. 16, 1995, Pat. No. 5,708,659, which is a continuation-in-part of application No. 08/354,682, Dec. 8, 1994, which is a continuation-in-part of application No. 08/139,551, Oct. 20, 1993, Pat. No. 5,446,726. This application Sep. 22, 1997, Appl. No. 934,684.

Int. Cl.[7] G06F *15/17;13/38*

U.S. Cl. 395—800.29 **1 Claim**

1. A single chip network apparatus comprising:



a host interface circuit adapted for connection directly to a host system bus, the host interface circuit being operative to send information to and receive information from the host system bus;

random access memory coupled to the host interface circuit;

a multi-port random access memory coupled to the host interface circuit;

a processor coupled to the random access memory for formatting information received from the host system bus to a network protocol format, and for converting information received in a network, protocol format to a form suitable for the host system bus; and

a network interface circuit coupled to the random access memory and adapted for connection directly to a network the network interface circuit being operative to send and receive information from the network where such information is in a network protocol format.

6,016,402

METHOD FOR INTEGRATING REMOVABLE MEDIA DISK DRIVE INTO OPERATING SYSTEM RECOGNIZED AS FIXED DISK TYPE AND MODIFYING OPERATING SYSTEM TO RECOGNIZE AS FLOPPY DISK TYPE

Trent M. Thomas, Layton, Utah; John A. Hensley, Raleigh, N.C., and Troy T. Davidson, Clearfield, Utah, assignors to Iomega Corporation, Roy, Utah

Filed May 21, 1996, Appl. No. 651,321

Int. Cl.[7] G06F *9/00;9/24*

U.S. Cl. 395—828 **18 Claims**

1. In a computer system comprising a processor, a removable media drive and a BIOS, wherein the BIOS supports a computer system wherein a first floppy disk drive attached to the computer system is configured as drive "A" and second floppy drive attached to the computer system is configured as drive "B," wherein a first fixed disk drive attached to the computer system is configured as drive "C" and a second fixed disk drive attached to the computer system is configured as drive "D," and wherein the BIOS boots an operating system from one of drive "A" and drive "C" into the processor, a method of adapting the computer system so that the operating system recognizes the removable media drive as the drive "A," comprising the steps of:

(a) configuring the removable media drive and the BIOS such that the BIOS recognizes the removable media drive as the drive "C";

(b) starting a boot sequence in which the BIOS requests a master boot record from the drive "C";

(c) transferring a substitute master boot record from the removable media drive to the processor; and,

(d) executing said substitute master boot record such that the operating system is loaded and is modified to recognize the removable media drive as drive "A"

(i) loading the operating system from one of the removable media drive and another fixed disk drive;

(ii) changing the removable media drive assignment within the operating system from the drive "C" to the drive "A".

6,016,403

STATE MACHINE DESIGN FOR GENERATING EMPTY AND FULL FLAGS IN AN ASYNCHRONOUS FIFO

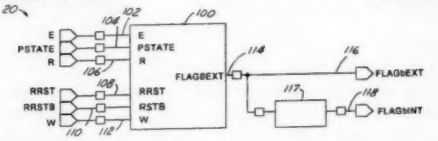
Andrew L. Hawkins, and Pidugu L. Narayana, both of Starkville, Miss., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Continuation of application No. 08/567,893, Dec. 6, 1995, Pat. No. 5,712,992. This application Aug. 14, 1997, Appl. No. 911,132.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *12/00*

U.S. Cl. 395—877 **37 Claims**



36. A method for determining the fullness of a buffer comprising the steps of:

generating one or more status flags indicating the fullness of said buffer in response to (i) a write clock, (ii) a read clock and (iii) a look-ahead signal.

6,016,404

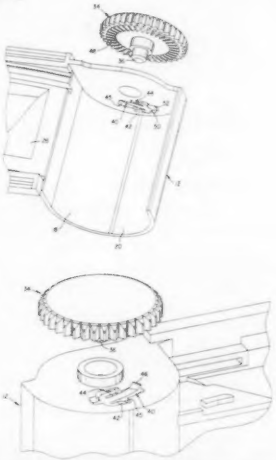
ONE-TIME-USE CAMERA WITH ANTI-BACKUP PAWL DISENGAGED FROM FILM WINDER DURING FILM LOADING

Anthony DiRisio, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 21, 1999, Appl. No. 234,954

Int. Cl.[7] G03B *1/00;17/02*

U.S. Cl. 396—6 **8 Claims**



1. A subassembly for a one-time-use camera comprising a main body part that has a film take-up chamber adapted to receive a film spool and a film supply chamber for an unexposed film roll, a film

winding thumbwheel supported for winding rotation in engagement with the film spool to similarly rotate the film spool to take up an exposed filmstrip, and an anti-backup pawl engageable with said thumbwheel to prevent unwinding rotation of said thumbwheel and disengageable from said thumbwheel to allow unwinding rotation of the thumbwheel to permit the film spool to be similarly rotated to unwind an exposed filmstrip from the film spool to form the unexposed film roll, is characterized in that:

said film take-up chamber is configured to allow the film spool to be received in said film take-up chamber in a film unwinding position for unwinding rotation of the film spool and to be in a different film winding position for winding rotation of the film spool; and

an actuator is movable to disengage said anti-backup pawl from said thumbwheel, and is located to be moved to disengage said anti-backup pawl from said thumbwheel in response to the film spool being received in said film take-up chamber in the film unwinding position and not when the film spool is in said film take-up chamber in the film winding position.

6,016,405

CAMERA SYSTEM FOR REDUCING THE INFLUENCE OF VIBRATION GENERATED BY ACTUATORS

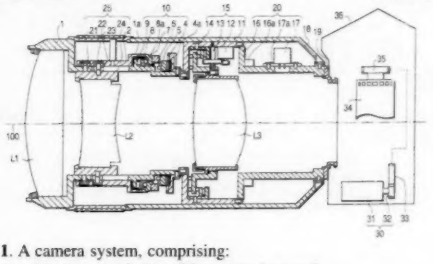
Tsuneo Watanabe, Tokyo; Ryoichi Suganuma, Yokohama, and Tadao Kai, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 9, 1995, Appl. No. 385,959

Claims priority, application Japan, Feb. 9, 1994, 6-015489; Aug. 22, 1994, 6-196760

Int. Cl.[7] G03B *5/00;* **H01L** *41/08*

U.S. Cl. 396—55 **24 Claims**



1. A camera system, comprising:

an actuator to perform a drive operation; and

a component member positioned in a transmission path of vibration generated by the actuator, the component member having a characteristic frequency that does not overlap with a drive frequency band of the actuator and does not overlap with a frequency band of vibration accompanying the drive operation, such that the vibration generated by the drive operation of the actuator does not cause the component member to resonate.

6,016,406

CAMERA FLASH UNIT INCLUDING A LENS COMPONENT WITH A TOROIDAL SURFACE

Arnold W. Lungershausen, W. Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1997, Appl. No. 808,493

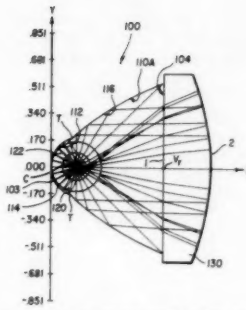
Int. Cl.[7] G03B *15/03;* **F21V** *5/00*

U.S. Cl. 396—200 **15 Claims**

1. A camera flash unit for illumination of an associated target surface comprising:

(i) a light source providing light defined as light rays;

(ii) a reflector directing the light rays from said light source towards the associated target surface, said reflector including one closed end, one open end, and highly reflective, curving



inner walls, said inner surface walls being symmetrical about at least one axis of symmetry; and

(iii) a refractive lens component located at said open end, said refractive component having two surfaces—a back side surface facing said light source and covering said opening and a front side surface, both of said surfaces intercepting and being centered on aid line of symmetry, one of said surfaces being a cylindrical surface, the other of said two surfaces being a toroidal surface and adapted to direct non collimated, fanned light rays toward the target surface.

6,016,407

ENERGY SAVING ELECTRONIC DEVICE

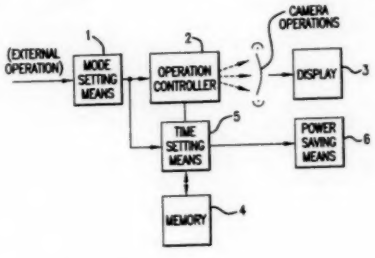
Daiki Tsukahara, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 23, 1998, Appl. No. 102,907

Claims priority, application Japan, Jul. 17, 1997, 9-192501

Int. Cl.[7] G03B *7/26*

U.S. Cl. 396—302 **35 Claims**



1. An electronic device, comprising:

an electronic component that consumes electrical power when operating;

a memory that stores a plurality of limit times, each of the limit times being stored in correspondence with a corresponding operation mode of the electronic device; and

a controller that automatically reduces an amount of power consumed by the electronic component after the electronic device has remained in a non-operation state for a selected one of the limit times, the selected one of the limit times being selected based on the operation mode in which the electronic device is set.

6,016,408

DEVELOPER CARTRIDGE FOR DEVELOPING A LATENT IMAGE DETACHABLY MOUNTABLE TO A MAIN ASSEMBLY OF AN IMAGE FORMING APPARATUS

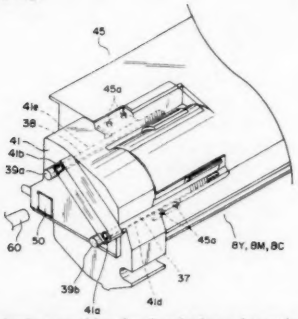
Kouji Hashimoto, Numazu; Yoshiro Tsuchiya, Yokohama, and Kenji Matsuda, Numazu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1997, Appl. No. 943,691

Claims priority, application Japan, Oct. 7, 1996, 8-265783; Oct. 2, 1997, 9-269897

Int. Cl.[7] **G03G** *15/08*

U.S. Cl. 399—27 **12 Claims**



1. A developing cartridge for developing a latent image formed on an electrophotographic photosensitive member, wherein the developing cartridge is detachably mountable to a main assembly of an electrophotographic image forming apparatus, the developing cartridge comprising:

a developing member for developing a latent image formed on the electrophotographic photosensitive member with toner;

a toner accommodating portion for accommodating toner to be used by said developing member;

first and second light transmitting portions provided in said toner accommodating portion;

a first light guide for directing, to said first light transmitting portion, light emitted by a light emission member provided in the main assembly; and

a second light guide for directing the light having passed through said second light transmitting portion to a light receiving element provided in the main assembly,

wherein said first light transmitting portion and said second light transmitting portion are disposed at positions closer to a longitudinal end where a developing bias contact is provided than the opposite longitudinal end,

wherein the developing bias contact receives a developing bias to be supplied to said developing member from the main assembly when said developing cartridge is mounted to the main assembly, and

wherein said developing bias contact is exposed at a longitudinal end of said developing cartridge.

6,016,409

SYSTEM FOR MANAGING FUSER MODULES IN A DIGITAL PRINTING APPARATUS

Michael E. Beard, Webster; Porfirio J. Perez, Walworth; James F. Smoak, Rochester; Edward C. Hanzlik, Fairport; Paul M. Fromm, Rochester, and Ihor Kulbida, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Provisional application No. 60/043,579, Apr. 11, 1997. This application Nov. 25, 1997, Appl. No. 978,300.

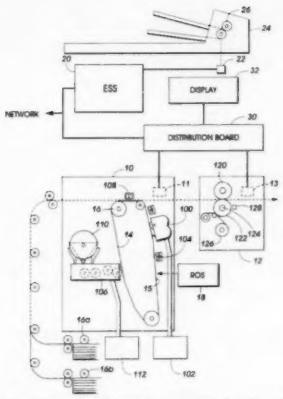
Int. Cl.[7] **G03G** *15/00;15/20*

U.S. Cl. 399—33 **16 Claims**

1. A module installable in a printing apparatus, comprising:

a heat element;

an electronically-readable memory;



a first code and a second code retained in the electronically-readable memory, the first code being symbolic of a operating requirement of the heat element for fusing marking material on a print sheet passing relative to the heat element when the module is installed in an apparatus which operates at a first speed, and said second code being symbolic of a operating requirement of the heat element for fusing marking material on a print sheet passing relative to the heat element when the module is installed in an apparatus which operates at a second speed.

6,016,410

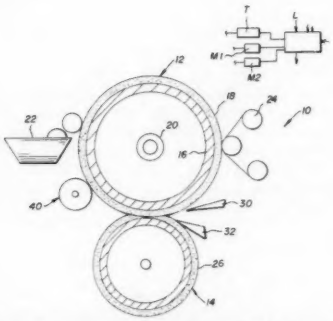
FUSER FOR REPRODUCTION APPARATUS WITH MINIMIZED TEMPERATURE DROOP

Muhammed Aslam; Fangsheng Wu, both of Rochester, and Robert D. Bobo, Ontario, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1998, Appl. No. 197,365

Int. Cl.[7] **G03G** *15/20*

U.S. Cl. 399—69 **12 Claims**



1. A fuser, for a reproduction apparatus, having at least one heated fuser roller operating at a setpoint temperature to permanently fix a marking particle image to a receiver member, and a mechanism for controlling temperature droop in said at least one heated fuser roller, said temperature droop controlling mechanism comprising:

an external heat source movable to a position in operative relation with said at least one heated fuser roller and a nonoperative position remote from said at least one heated fuser roller;

a source of pressurized air; and

a logic and control unit for

(1) regulating heat input to said at least one heated fuser roller, during an idle period, to maintain said at least one heated fuser roller at an idle temperature above the set point temperature;

(2) at the actuation of the reproduction apparatus job run start, regulating heat input to said at least one heated fuser roller to heat the fuser roller to a temperature above said idle temperature

(3) after a preselected time, actuating said source of pressurized air direct air flow at said at least one heated fuser roller for creating an intended thermal gradient in said at least one heated fuser roller; and

(4) at a preselected time later, enabling a first receiver member of a reproduction job run to be transported into operative relation with said at least one heated fuser roller, whereby there is substantially no temperature droop in said at least one heated fuser roller.

6,016,411

EFFICIENT DEVELOPMENT OF AN ELECTROSTATIC LATENT IMAGE

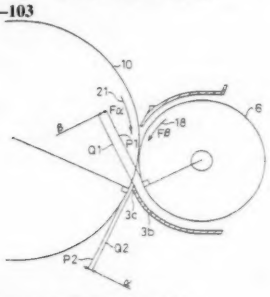
Takahiko Kimura, Ikoma; Yoshiki Ichikawa, Kashihara; Jun Yamaguchi, Ikoma; Masahiro Tsuji, Nara, and Yoshiaki Sanada, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 15, 1998, Appl. No. 94,986

Claims priority, application Japan, Jun. 16, 1997, 9-158326

Int. Cl.[7] **G03G** *15/08*

U.S. Cl. 399—103 **11 Claims**



1. A development apparatus comprising:

a carrier for carrying a latent image;

a development housing for containing a developer therein, disposed opposite to the carrier for carrying a latent image;

a developing roller provided rotatably in the development housing to be rotated in a predetermined direction,

wherein the developer in the development housing is carried by the developing roller and the developer carried by the developing roller is applied to the carrier through an opening formed in the development housing, and wherein a rotation speed Fβ of the developing roller is higher than a movement speed Fα of the carrier;

a gap β disposed between an opening downstream of a side wall portion of the development housing and the developing roller; and

a gap α disposed between the opening downstream of a side wall portion of the developing housing and the carrier, wherein the gap β is larger than the gap α, wherein a speed ratio K (K=Fβ/Fα) of Fβ to Fα and a gap ratio T (T=α/β) of the gap α to the gap β is so as to satisfy T<1/K.

6,016,412

PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS USABLE WITH THIS PROCESS CARTRIDGE

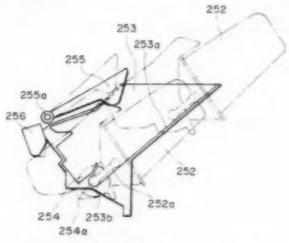
Shinji Goto, Yokohama; Jun Saito, Kawasaki; Hiroyuki Ishii, Yokohama; Masao Ando, Yokohama; Yoshiaki Watanabe, Yokohama; Yuzo Isoda, Yokohama; Masahide Tanoue, Yokohama, and Ryukichi Inoue, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/754,630, Nov. 21, 1996, Pat. No. 5,734,949, which is a continuation of application No. 08/295,087, Aug. 24, 1994, abandoned, which is a continuation of application No. 07/905,552, Jun. 25, 1992, Pat. No. 5,745,823. This application Feb. 2, 1998, Appl. No. 17,316.

Claims priority, application Japan, Jun. 28, 1991, 3-183933; Feb. 28, 1992, 4-079243; Jun. 4, 1992, 4-144484

Int. Cl.[7] **G03G** *21/16*

U.S. Cl. 399—111 **18 Claims**



1. A process cartridge detachably mountable to a main assembly of an image forming apparatus, comprising:

an electrophotographic photosensitive member;

process means actable on said photosensitive member;

a cartridge frame;

a first projection for positioning said process cartridge relative to the main assembly when the process cartridge is mounted to the main assembly, said first projection being outwardly projected from a first frame portion of said cartridge frame adjacent an axial end of said photosensitive member;

a second projection for positioning said process cartridge relative to the main assembly when the process cartridge is mounted to the main assembly, said second projection being outwardly projected from a second frame portion of said cartridge frame adjacent another axial end of said photosensitive member;

a confining contact portion, in said cartridge frame, for contacting a first fixed portion of the main assembly and cooperating with said first projection and said second projection to correctly position said process cartridge relative to the main assembly, when said process cartridge is mounted to the main assembly; and

a releasing contact portion, in said cartridge frame, for contacting a second fixed portion of the main assembly to provide a pivot of rotation of said process cartridge, when said process cartridge is demounted from the main assembly.

6,016,413

ASSEMBLING METHOD OF PROCESS CARTRIDGE, ASSEMBLING METHOD AND PROCESS CARTRIDGE

Katsunori Yokoyama, Susono; Kazushi Watanabe, and Atsushi Numagami, both of Mishima, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

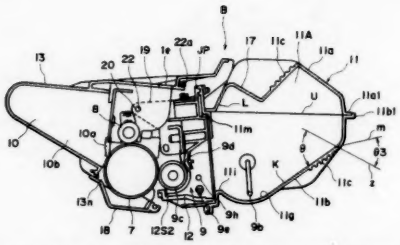
Filed Jul. 2, 1997, Appl. No. 887,457

Claims priority, application Japan, Jul. 4, 1996, 8-195727

Int. Cl.[7] **G03G** *15/00*

U.S. Cl. 399—113 **16 Claims**

1. An assembling method of a process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, comprising:



(a) providing a drum frame supporting an electrophotographic photosensitive drum and having a first engaging portion above said electrophotographic photosensitive drum adjacent one longitudinal end of said electrophotographic photosensitive drum, and a second engaging portion above said electrophotographic photosensitive drum adjacent the other longitudinal end of said electrophotographic photosensitive drum;

(b) providing a developing device frame supporting a developing member for developing a latent image formed on said electrophotographic photosensitive drum, and having a first compression spring and a second compression spring above said developing member adjacent one and the other longitudinal ends of said developing member, and a first projected portion and a second projected portion projected in a direction crossing with a longitudinal direction of said developing member adjacent the one and the other longitudinal ends of said developing member;

(c) an engaging step of engaging said first projected portion and said first engaging portion and engaging said second projected portion and said second engaging portion;

(d) a penetration step of (i) penetrating a first penetrating member through a first opening, which is formed in said first projected portion, and a third opening and a fifth opening formed in said first engaging portion, said third opening and said fifth opening being opposed to each other with said first projected portion therebetween when said first projected portion and said first engaging portion are engaged with each other, said first penetrating member entering said third opening, then said first opening and then said fifth opening, and (ii) penetrating a second penetrating member through a second opening, which is formed in said second projected portion, and a fourth opening and a sixth opening formed in said second engaging portion, while said second projected portion and said second engaging portion are engaged with each other, so as to couple said drum frame and developing device frame, said fourth opening and said sixth opening being opposed to each other with said second projected portion therebetween when said second projected portion and said second engaging portion are engaged with each other, and said second penetrating member entering said fourth opening, then said second opening and then said sixth opening.

6,016,414

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, ELECTROPHOTOGRAPHIC APPARATUS AND PROCESS CARTRIDGE

Hideki Anayama, Yokohama; Akio Maruyama, Tokyo, and Kazushige Nakamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

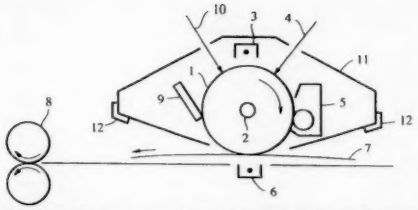
Filed Dec. 5, 1995, Appl. No. 567,535

Claims priority, application Japan, Dec. 7, 1994, 6-303946

Int. Cl.[7] G03G *15/00*

U.S. Cl. 399—159 **10 Claims**

1. An electrophotographic photosensitive member having enhanced durability and providing high image quality without accumulating significant residual potential during repeated use comprising: a conductive support, a photosensitive layer containing a polycarbonate resin and a protective layer containing a setting resin, wherein said setting resin of said protective layer is



selected from the group consisting of acrylic resin, urethane resin, silicone resin and melamine resin, and wherein said polycarbonate resin of said photosensitive layer is at least one resin and which (i) provides a glass transition point of 170° C. or more and (ii) has 9,9 -fluorenilidene or 2,2-propylidene as a central unit.

6,016,415

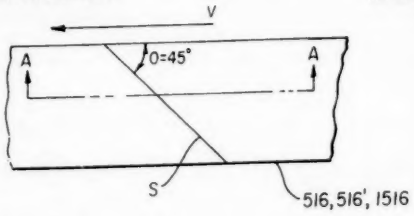
IMAGE TRANSFER APPARATUS AND METHOD USING A SEAMED ENDLESS BELT

Diane M. Herrick, Rochester; Thomas N. Tombs, Brockport, and Frank L. Ziegelmuller, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1998, Appl. No. 199,896

Int. Cl.[7] G03G *15/00*

U.S. Cl. 399—162 **34 Claims**



1. A reproduction method comprising:

moving a toner image bearing member (TIBM) having a toner image formed thereon in a process direction through a transfer nip, the toner image being present in the nip for transfer;

moving a belt in the process direction while supported in the nip in transfer relation with the TIBM, the belt having a seam that is configured in a configuration other than a straight line perpendicular to the process direction, the seam being present in the nip; and

transferring the toner image from the TIBM towards an area of the belt having the seam as the belt and TIBM move through the nip wherein the belt supports a receiver member in the nip and the receiver member is supported on the area of the belt having the same and the receiver member receives the toner image in transfer from the TIBM.

6,016,416

IMAGE RECORDING APPARATUS HAVING A DRUM AND A ROLLER WITH INTERMESHING GEARS

Makoto Kitamura, Tokyo, Japan, assignor to Oki Data Corporation, Tokyo, Japan

Filed Sep. 9, 1998, Appl. No. 150,043

Claims priority, application Japan, Sep. 11, 1997, 9-246933

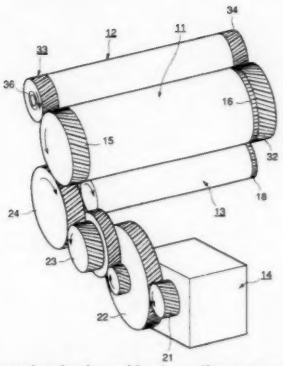
Int. Cl.[7] G03G *15/00*

U.S. Cl. 399—167 **5 Claims**

1. An image recording apparatus, comprising:

a photoconductive drum having a first rotational axis and drum gears rotatable about the first rotational axis, the drum gears being fixedly mounted to said photoconductive drum at opposite ends of the rotational axis;

a roller in pressure contact with said photoconductive drum, said roller having a second rotational axis substantially parallel to



the first rotational axis, and having roller gears rotatable about the second rotational axis, the roller gears being fixedly mounted to said roller at opposite ends of the second rotational axis, the roller gears being in mesh with the drum gears;

wherein at least one of the roller gears is provided with a one-way clutch which is locked only when a drive force is applied to the roller gear,

whereby a surface of said roller is in uniform pressure contact with a surface of said drum between the respective gears, and along respective lengths of said drum and said roller.

6,016,417

INTERMEDIATE TRANSFER MEDIUM, METHOD FOR PRODUCING THE SAME AND IMAGE FORMING DEVICE USING THE SAME

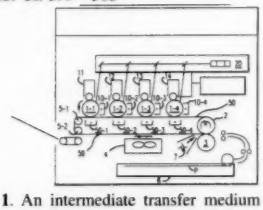
Ryuji Katsuno; Masanori Kobayashi; Tatsuo Okuno; Chikara Ando; Kazuhiko Arai; Yoshihisa Kitano; Nobuhiro Katsuta, all of Nakai-machi, and Yasuo Sakaguchi, Minamiashigara, all of Japan, assignors to Fuji Xerox, Co., Ltd, Tokyo, Japan

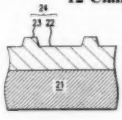
Filed Oct. 27, 1997, Appl. No. 958,250

Claims priority, application Japan, Nov. 8, 1996, 8-296837

Int. Cl.[7] G03G *15/14;15/16*

U.S. Cl. 399—308 **12 Claims**





1. An intermediate transfer medium to be used for an image forming method comprising the steps of developing a photoreceptor with an electrostatic latent image formed thereon in a developer containing toner, primarily transferring the developed toner image onto the intermediate transfer medium, and thereafter putting the primarily transferred toner image in contact to a recording medium to transfer the toner image onto the recording medium at least by heating, the intermediate transfer medium comprising a surface with the toner image primarily transferred thereon, which is of smooth surface with protrusions dispersed thereon in a manner such that the smooth surface and the protrusions might be discriminated from each other,

wherein the relation between the area ratio of the smooth surface on the surface of the intermediate transfer medium where the image is primarily transferred (Cin %) and the height of the protrusions (h (μm)) satisfies the following experimental formula (1):

$$h \leqq 19 \cdot (1 - Cin/100)^{-1/2} - 24.5 \quad (1).$$

6,016,418

IMAGE FORMING APPARATUS

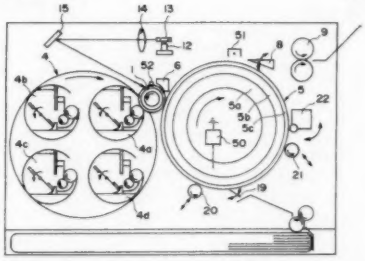
Nobuaki Kabeya, Toride; Akihiko Takeuchi, Yokohama; Toshihiko Ochiai, Tokyo; Motoi Katoh, Yokohama; Toshiaki Miyashiro, Ichikawa; Takehiko Suzuki, and Takao Kume, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/707,498, Sep. 24, 1996, abandoned, which is a continuation of application No. 08/388,413, Feb. 14, 1995, abandoned. This application Sep. 19, 1997, Appl. No. 934,136.

Claims priority, application Japan, Feb. 14, 1994, 6-037556; Feb. 7, 1995, 7-019294

Int. Cl.[7] G03G *15/16*

U.S. Cl. 399—314 **14 Claims**



1. An image forming apparatus comprising:

an image bearing member for electrostatically bearing a toner image;

a dielectric member movable along an endless path through a transfer position of said image bearing member, wherein said dielectric member cooperates with said image bearing member to form an image transfer nip at said transfer position;

an electroconductive member in contact with said dielectric member at a side remote from said image bearing member, wherein said electroconductive member is supplied with a transfer potential having a polarity opposite from that of a charge polarity of the toner image when the toner image is transferred at the image transfer nip;

wherein said electroconductive member is supplied with a potential having a polarity the same as that of said transfer potential and having a lower level than said transfer potential or with a ground potential while a surface of said dielectric member carries a charge with a polarity which is the same as the polarity of the toner, so as to generate an electric field for transferring the toner from said dielectric member to said image bearing member at the transfer position.

6,016,419

IMAGE FORMING APPARATUS

Atsuto Hirai, Ikoma, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 1, 1998, Appl. No. 144,992

Claims priority, application Japan, Sep. 3, 1997, 9-238070

Int. Cl.[7] G03G *15/00*

U.S. Cl. 399—390 **24 Claims**

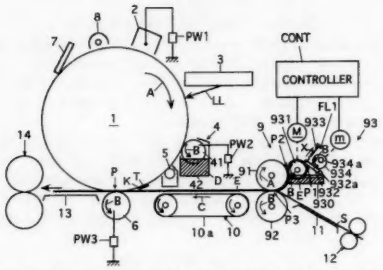
1. An image forming apparatus comprising:

an image holding device for holding on its surface an image developed with liquid developer;

a record medium transporting device for transporting a record medium from a supply position to a transfer position for transferring the image developed on said image holding device onto a surface of said record medium;

a transfer agent supply device for supplying a transfer agent onto said surface of said record medium during transportation between said supply position and said transfer position; and

a control device for controlling a quantity of the transfer agent supplied from said transfer agent supply device to said record



medium in accordance with a property of said record medium determined in advance with respect to said record medium.

6,016,420

ELECTROSTATIC TRANSPORT SYSTEM FOR TONERED SHEETS

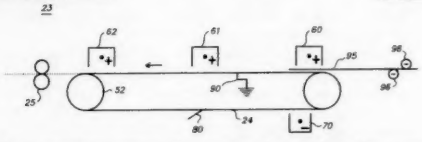
Robert Janssens, Geel; Werner Heirbaut, Sint Niklaas; Luc Van Goethem, Sint-Gillis-Waas; Peter Baeyens, Melsele, and Frank Trouillard, Lint, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Mar. 17, 1998, Appl. No. 40,056

Claims priority, application European Pat. Off., Mar. 17, 1997, 97200790

Int. Cl.[7] **G03G** *21/00*

U.S. Cl. 399—397 **16 Claims**



1. A transport system for transporting a sheet-like receptor support carrying particles having an electrostatic particle charge, said electrostatic particle charge having a polarity, the transport system comprising:

a surface on the transport system for making contact with the support and for transporting the support;

a first charge generating device for applying first electrostatic charges to the support and establishing an electrostatic attraction between the support and the surface to adhere said particles to said support during transport, the first electrostatic charges having a polarity opposite to the polarity of the electrostatic particle charge.

6,016,421

CONFLICT RESOLUTION IN A MULTI-BEAM MULTI-SITE PAGING SYSTEM

Anthony J. Weiss, Tel Aviv; Yair Karmi, Rishon Lezion, both of Israel; Ilan Zorman, and Haim Harel, both of Palo Alto, Calif., assignors to Wireless Online, Inc., Los Altos, Calif.

Filed Nov. 17, 1997, Appl. No. 971,596

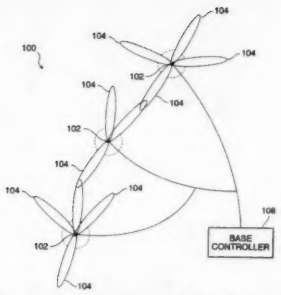
Int. Cl.[7] **H04B** *1/10*

U.S. Cl. 455—63 **24 Claims**

1. In a paging network wherein paging messages are transmitted to subscriber units via a plurality of transmission beams radiated from a plurality of transmitter sites, a method for scheduling messages for transmission by said plurality of transmission beams by the steps of:

a) determining which ones of said plurality of transmission beams are usable to access which ones of said plurality of subscriber units;

b) determining for each of said plurality of subscriber units which transmission beams interfere with one another; and



c) scheduling messages for transmission by particular ones of said transmission beams based on which ones of said plurality of transmission beams are useable to access which ones of said plurality of subscriber units as determined in said a) step, based on which transmission beams interfere with one another as determined in said b) step, wherein interference between disparate transmissions by different ones of said transmission beams is avoided, and further based on priority levels of said messages so as to transmit messages having higher priority levels sooner, by

c1) selecting messages having a given priority or greater that may be transmitted simultaneously via transmission beams of said plurality of transmission beams without causing conflict due to interference as determined in said b) step;

c2) scheduling said selected messages for simultaneous transmission during a particular time period;

c3) if transmission beams of said plurality of transmission beams remain available during said particular time period, lowering said given priority; and

c4) repeating said c1) and c2) steps.

6,016,422

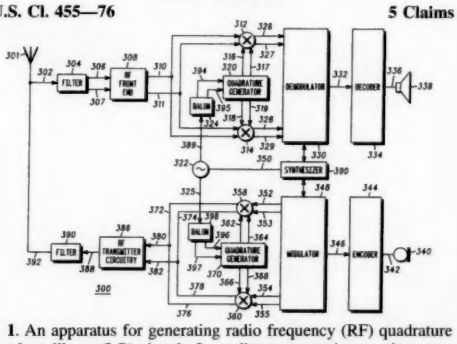
METHOD OF AND APPARATUS FOR GENERATING RADIO FREQUENCY QUADRATURE LO SIGNALS FOR DIRECT CONVERSION TRANSCEIVERS

Paul John Bartusiak, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1997, Appl. No. 962,473

Int. Cl.[7] **H04B** *1/50*

U.S. Cl. 455—76 **5 Claims**



1. An apparatus for generating radio frequency (RF) quadrature local oscillator (LO) signals for a direct conversion receiver or a direct launch transmitter of a radiotelephone, wherein the RF quadrature LO signals are at substantially a same frequency as a desired received signal detected at an antenna of the radiotelephone when the RF quadrature LO signals are used for the direct conversion receiver, and wherein the RF quadrature LO signals are at substantially a same frequency as a transmission signal transmitted from the antenna of the radiotelephone when the RF quadrature LO signals are used for the direct launch transmitter, the apparatus comprising:

an oscillator for producing an RF clock signal, wherein the RF clock signal has an RF clock frequency substantially twice the frequency as the desired received signal detected at the antenna of the radiotelephone when the RF quadrature LO signals are used for the direct conversion receiver, and wherein the RF clock signal has the RF clock frequency substantially twice the frequency as the transmission signal transmitted from the antenna of the radiotelephone when the RF quadrature LO signals are used for the direct launch transmitter;

a frequency divider coupled to the oscillator for producing a differential frequency divided signal responsive to the RF clock signal, wherein the differential frequency divided signal is at substantially the same frequency as the desired received signal detected at the antenna of the radiotelephone when the RF quadrature LO signals are used for the direct conversion receiver, and wherein the differential frequency divided signal is at substantially the same frequency as the transmission signal transmitted from the antenna of the radiotelephone when the RF quadrature LO signals are used for the direct launch transmitter, the frequency divider consisting of a pair of flip-flops having an output of a first flip-flop of the pair of flip-flops coupled to an input of a second flip-flop of the pair of flip-flops, and having an output of the second flip-flop coupled to an input of the first flip-flop,

a phase shift network coupled to the frequency divider for generating a pulse train-pair in response to the differential frequency divided signal, the pulse train-pair including a first differential pulse train and a second differential pulse train, wherein the first differential pulse train and the second differential pulse train are at substantially a same frequency but offset in phase relative to one another by substantially ninety degrees;

an input buffer coupled to the oscillator and the frequency divider to produce a buffered differential RF clock signal that is applied to the frequency divider, the frequency divider producing the differential frequency divided signal at the output of the first flip-flop and the second flip-flop responsive to the buffered differential RF clock signal; and

a feedback control circuit coupled to receive signals representative of phases of the first and second differential pulse trains, respectively, the feedback control circuit having a phase determining circuit for determining a relative phase difference between the phases of the first and second differential pulse trains and for generating a control signal representative of the relative phase difference for application to the phase shift network, wherein the phase shift network adjusts the relative phase difference when the first and second differential pulse trains are beyond phase quadrature with one another to position and maintain the first and second differential pulse trains in phase quadrature with one another.

6,016,423

MOBILE COMMUNICATOR SYSTEM

David J. Ross, Leesburg, Va.; Blake L. Isaacs, Logan, Utah, and Kevin J. Williams, Eugene, Oreg., assignors to AMSC Subsidiary Corporation, Reston, Va.

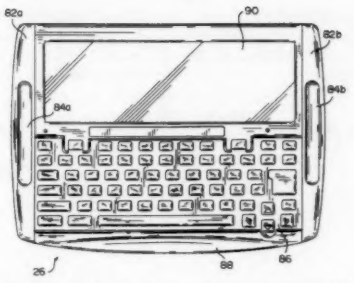
Continuation of application No. 08/445,777, May 22, 1995, Pat. No. 5,613,223, and a continuation-in-part of application No. 08/187,996, Jan. 28, 1994, Pat. No. 5,512,912, said application No. 08/445,777 is a continuation-in-part of application No. 08/408,526, Mar. 22, 1995, Pat. No. 5,594,953. This application Feb. 6, 1997, Appl. No. 796,769.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04B *1/08*

U.S. Cl. 455—90 **25 Claims**

1. A mobile communication system comprising:



a housing comprised of a shock resistant material, said housing including end bumpers comprised of an elastomeric material for absorbing shock experienced by said housing;

an input device for inputting data, said input device comprising a keyboard including a rubber/carbon membrane and mounted in said housing using a first seal to prevent fluid from entering the mobile communication system between said input device and said housing;

a central processing unit, disposed in said housing, and receiving the data from said input device;

a display monitor comprised of tempered glass having the ability to withstand a predetermined impact, said display monitor mounted in said housing using a second seal to prevent fluid from entering between said display monitor and said housing.

6,016,424

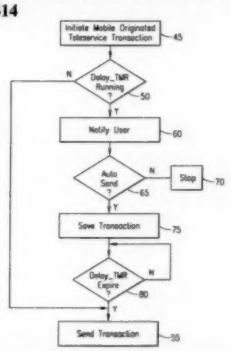
USER NOTIFICATION OF MOBILE STATION ORIGINATED TELESERVICE TRANSACTION DELAY

Scott Gordon Hicks, Apex, and David James Hoover, Cary, both of N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Oct. 29, 1997, Appl. No. 960,440

Int. Cl.[7] H04M *3/42;11/10;* **H04Q** *7/20;7/00*

U.S. Cl. 455—414 **17 Claims**



1. A method for providing a mobile station user notification of a teleservice transaction delay, comprising the steps of:

receiving a request at a mobile station for origination of a teleservice transaction;

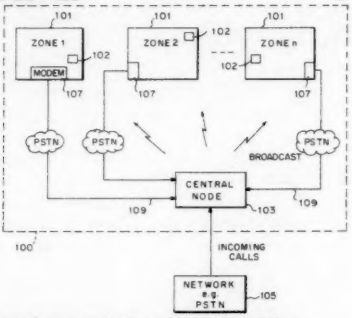
determining if initiation of the teleservice transaction will be delayed wherein the step of determining further comprises determining whether a DELAY_TMR parameter is currently running; and

notifying the mobile station user of the teleservice transaction delay.

6,016,425
HYBRID MULTIZONE CALL DELIVERY SYSTEM

Cecil H. Bannister, Richardson, Tex., assignor to Nortel Networks Corporation, Montreal, Canada

Continuation of application No. 08/366,546, Dec. 29, 1994, abandoned. This application Sep. 3, 1996, Appl. No. 718,010.
Int. Cl.[7] H04Q *7/20*
U.S. Cl. 455—422 **19 Claims**



1. A zoned communication network comprising:

a central node; and

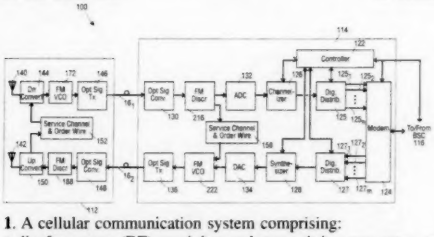
at least two zone cells, each having a plurality of base stations and a zone controller for controlling an associated zone cell, said zone controller including a visitor location register that is distinct from said plurality of base stations and that maintains a list of portables currently in said zone cell such that said central node need not maintain a home location register for storing a list of locations of portables,

wherein said central node establishes a communication link between an incoming call received at said central node and a portable in said zone cell, said zone controller registering an identifier of said portable in said visitor location register as said portable enters said zone cell and being responsive to an indication of said incoming call from said central node to page said portable and signal said central node to establish said communication link if said portable is available to receive said incoming call, said zone controller deleting said identifier of said portable from said visitor location register when said portable leaves said zone cell, said zone controller storing an updatable black list of identifiers of portables that said network will not service.

6,016,426
METHOD AND SYSTEM FOR CELLULAR COMMUNICATION WITH CENTRALIZED CONTROL AND SIGNAL PROCESSING

Donald H. Bodell, Trumbull, Conn., assignor to MVS, Incorporated, Trumbull, Conn.

Filed Oct. 10, 1996, Appl. No. 729,005
Int. Cl.[7] H04Q *7/22*
U.S. Cl. 455—422 **29 Claims**



1. A cellular communication system comprising:

radio frequency (RF) receiving and transmitting apparatus at a cell site, said apparatus comprising:

a radio frequency energy receiver for receiving radio frequency energy at frequencies within a predetermined range of radio frequencies and modulated by first data signals, wherein the received RF energy has a first spectral occupancy; and

a radio frequency energy transmitter for transmitting radio frequency energy at frequencies within a predetermined range of frequencies and modulated by second data signals, wherein the transmitted RF energy has a second spectral occupancy;

said cell site comprising:

downconverting means coupled to said receiver for converting the modulated radio frequency energy received by said receiver to intermediate frequency energy modulated by said first data signals and having a frequency lower than said predetermined range of frequencies of energy received by said receiver, wherein the intermediate frequency energy has the first spectral occupancy;

frequency modulating means coupled to said downconverting means for converting said downconverted energy modulated by said first data signals to first frequency modulated signals;

a first optical signal transmitter coupled to said frequency modulating means for transmitting optical signals modulated by said first frequency modulated signals;

a first optical signal receiver for converting optical signals into first electrical signals, wherein said electrical signals have the second spectral occupancy; and

upconverting means coupled to said first optical signal receiver for converting said first electrical signals into radio frequency energy at frequencies in said predetermined range of frequencies at which said transmitter transmits modulated radio frequency energy, said radio frequency energy transmitter being coupled to said upconverting means for transmitting the radio frequency energy into which said upconverter converts said first electrical signals;

a telephone switching office comprising:

a second optical signal receiver for converting the optical signals into second electrical signals;

frequency discriminating means coupled to said second optical signal receiver for frequency demodulating said second electrical signals;

switching and control means coupled to said frequency discriminating means for providing output signals corresponding to said frequency demodulated second electrical signals, said switching and control means also being connectable to a source of data signals for providing second data signals; and

a second optical signal transmitter coupled to said switching and control means for transmitting analogically m odulated optical signals corresponding to said second d ata signals; and

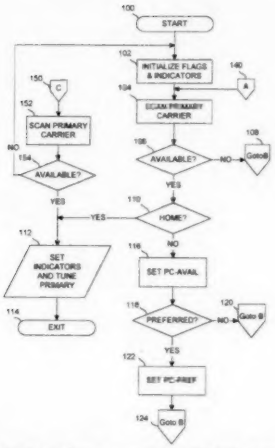
at least one optical fiber interconnecting said first optical signal transmitter with said second optical signal receiver and interconnecting said second output signal transmitter with said first optical signal receiver.

6,016,427
PREFERRED CARRIER SELECTION METHOD

Clifton J. Barber, Forest Park, and Stephen T. Hardin, Snellville, both of Ga., assignors to Oki Telecom, Inc., Suwanee, Ga.

Continuation of application No. 08/794,267, Jan. 31, 1997, Pat. No. 5,784,693, which is a continuation of application No. 08/442,883, May 17, 1995, which is a continuation of application No. 08/073,947, Jun. 8, 1993, Pat. No. 5,442,806. This application Mar. 18, 1998, Appl. No. 40,556.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H04Q *7/00*
U.S. Cl. 455—434 **29 Claims**

1. A method for selecting a cellular carrier for accessing cellular airtime services, said method comprising steps of:



defining at least one home system identification code (SID) and at least one preferred SID;

monitoring cellular carrier signals to detect SIDs corresponding to cellular carriers;

selecting a cellular carrier corresponding to a SID matching the home SID if the SID matching the home SID is detected;

selecting a cellular carrier corresponding to a SID matching the preferred SID if

the SID matching the preferred SID is detected and

no SID matching the home SID is detected; and

selecting a cellular carrier corresponding to a SID not matching the home SID and not matching the preferred SID if

the SID not matching the home SID and not matching the preferred SID is detected and

no SID matching the home SID or the preferred SID is detected,

wherein each of said selecting steps includes selecting cellular carriers for processing calls to emergency and non-emergency destination telephone numbers.

6,016,428

REGISTRATION CONTROL OF MOBILE STATIONS IN A WIRELESS COMMUNICATION SYSTEM

John Diachina, Garner, and Raymond C. Henry, Wake Forest, both of N.C., assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 18, 1995, Appl. No. 544,839

Int. Cl.[7] H04B *1/00*

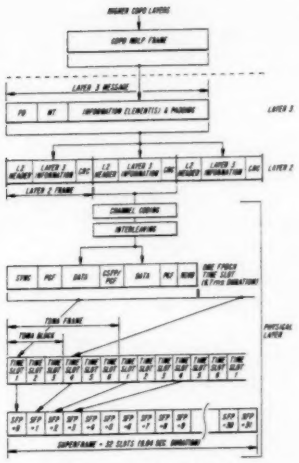
U.S. Cl. 455—435 **6 Claims**

1. A method for maintaining parameters associated with functions in a wireless communication system, comprising the steps of:

(a) maintaining functions associated with parameters on a first channel;

(b) determining on a second channel whether one of the parameters indicates that functions associated with said one parameter are to be executed after a mobile station moves from said first channel to said second channel;

(c) returning to said first channel from said second channel when said one parameter indicates that functions are to be executed at step (b); and



(d) executing the functions associated with said one parameter on said first channel.

6,016,429

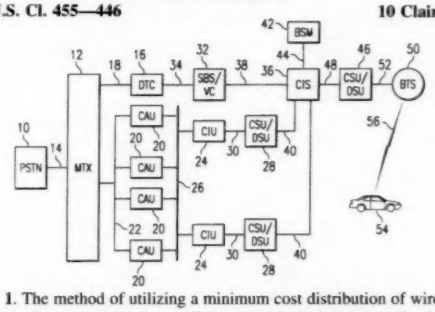
METHOD AND APPARATUS FOR MINIMIZING CELLULAR NETWORK COSTS WHEN UPGRADING THE ELECTRONICS IN AN EXISTING CELLULAR SYSTEM

Farid Khafizov, Dallas; Nikhil Jain, Plano, and Damodar Anandampillai, Dallas, all of Tex., assignors to Northern Telecom Limited, Montreal, Canada

Filed May 28, 1997, Appl. No. 864,259

Int. Cl.[7] H04Q *7/36*

U.S. Cl. 455—446 **10 Claims**



1. The method of utilizing a minimum cost distribution of wired network components in a cellular communication system having vocoders in a BSC (base station controller) and having a plurality of BTSs (base stations) each having channel elements, where the BSCs and the BTSs comprise a portion of a wired network, comprising, the steps of:

a) computing the number of vocoders N_VC required such that a first value of vocoder blocking probability "b" is not exceeded which value b is less than ½ the value of total allowed wired network blocking probability "BP";

b) computing the total number of channel cards N_CC required in all the BTSs such that a first value of vocoder blocking probability "(BP−b)/(1−b)" is not exceeded for any of the BTSs;

c) calculating wired system costs based on the numbers last obtained for $N_{-VC \text{ and } N-CC}$;

d) repeating, ((BP−b)/(1−b))/b additional times, steps a), b) and c) whereby a lowest wired system cost may be ascertained

from examining the results of step c) and whereby ((BP−b)/(1−b))/b, if not a whole number is rounded up to a whole number; and

e) providing the vocoders and channel cards for the cellular communications system based on one or more of steps a) and b) above.

6,016,430

RADIO COMMUNICATION SYSTEM AND METHOD FOR AVOIDING CONTROL CHANNEL INTERFERENCE

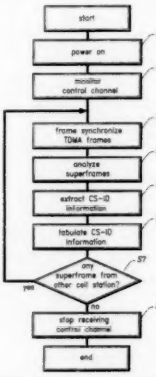
Kiyohiko Shinomiya, Zama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 27, 1997, Appl. No. 835,028

Claims priority, application Japan, Mar. 29, 1996, 8-077130

Int. Cl.[7] H04B *7/005;7/00;* **H04J** *3/06*

U.S. Cl. 455—515 **38 Claims**



1. A radio communication system including a plurality of base stations which communicate with a plurality of radio terminal stations respectively, each of said plurality of base stations comprising:

means for receiving a superframe signal including a control channel signal which is being transmitted at a certain interval by each of the other base stations in the system;

means for frame synchronizing TDMA frames of the control channel signals which are received by said control channel signal receiving means;

means for extracting base station identification information of each of the other base stations transmitting control channel signals respectively, from the TDMA frames which are frame synchronized by said TDMA frame synchronizing means;

means for storing in memory each of the base station identification information which is extracted by said base station identification information extracting means; and

means for determining a cycle of transmitting said superframe signal in accordance with the number of the other base stations using the control channel in the system, which is determined based upon the base station identification information stored in the memory.

6,016,431

RADIOTELEPHONES WITH INTEGRATED MATCHING ANTENNA SYSTEMS

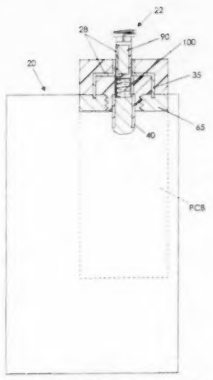
Howard Eugene Holshouser, Efland, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Apr. 29, 1997, Appl. No. 841,193

Int. Cl.[7] H04Q *7/20*

U.S. Cl. 455—550 **40 Claims**

1. A radiotelephone, comprising:



a radiotelephone housing having opposing first and second ends, said first end including a passage having a predetermined length wherein said passage includes at least one conducting portion thereon;

a conductive shell having first and second segments positioned in a top portion of said housing, wherein said first segment is cylindrical and is positioned proximate to said passage and said second segment is positioned such that it is spatially separated a further distance away from said passage relative to said first cylindrical segment; and

a retractable antenna having opposing first and second ends and defining a central axis through the center thereof, said antenna slidably extendable through said passage about said central axis between a first extended position and a second retracted position;

wherein when said antenna is in said first extended position said antenna transversely aligns with said conductive shell to define a coaxial capacitor therebetween.

6,016,432

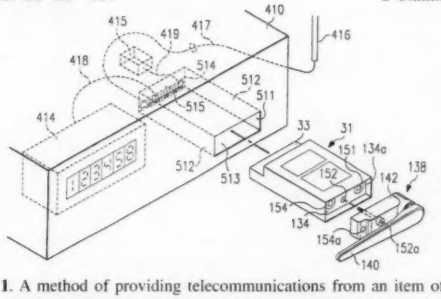
ELECTRONIC METERING EQUIPMENT SYSTEM

Per Stein, Stockholm, Sweden, assignor to Telefonaktiebolaget L/M Ericsson (publ), Stockholm, Sweden

Continuation-in-part of application No. 08/353,966, Dec. 12, 1994, Pat. No. 5,628,055, which is a continuation of application No. 08/026,478, Mar. 4, 1993, abandoned. This application Jun. 6, 1995, Appl. No. 469,655.

Int. Cl.[7] H04B *1/38*

U.S. Cl. 455—557 **2 Claims**



1. A method of providing telecommunications from an item of electronic equipment used in measuring a flowing commodity including electricity, fluids, traffic, comprising the steps of:

providing a port in the item of electronic equipment, said port having a module connector disposed therein;

providing a removable modular telecommunications unit having:

a first end;

a second end;

a telecommunications transceiver for communicating with one of a plurality of standardized wireless networks in accordance with at least one preselected communications standard;

a system connector disposed on said first end;

a power connector disposed on said second end; and

an antenna connector disposed on said second end;

disposing said removable modular telecommunications unit within said port so as to electrically couple said system connector to said module connector;

providing power to said telecommunications transceiver by electrically coupling an external power source to said power connector; and

electrically coupling an external antenna to said telecommunications transceiver through said antenna connector.

6,016,433

OXIDE SUPERCONDUCTOR JOSEPHSON JUNCTION ELEMENT AND PROCESS FOR PRODUCING SAME

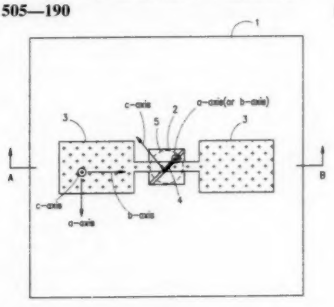
Yuuji Mizuno, Kashiwa; Yoshihiro Ishimaru, Yokohama, and Youichi Enomoto, Tokyo, all of Japan, assignors to International Superconductivity Technology Center, and Sharp Kabushiki Kaisha, both of Japan

Filed Sep. 2, 1997, Appl. No. 921,551

Claims priority, application Japan, Sep. 2, 1996, 8-232347

Int. Cl.[7] **H01B** *12/00;* **H01L** *29/06*

U.S. Cl. 505—190 **8 Claims**



1. An oxide superconductor Josephson junction element comprising a substrate and, on said substrate, oxide superconductors oriented in the c-axis direction with respect to said substrate, and an a-axis or b-axis oriented oxide superconductor, sandwiched between said c-axis oriented superconductors, said a-axis or b-axis oriented oxide superconductor having opposing sides contacting said c-axis oriented superconductors along crystal boundaries defining a junction plane extending across said c-axis oriented superconductors in a direction perpendicular to the a-axis of the a-axis oriented superconductor or to the b-axis of the b-axis oriented superconductor, the crystal boundaries between said a-axis or b-axis oriented oxide superconductor and each of said c-axis oriented superconductors forming a weak link of the Josephson junction, and said a-axis or b-axis oriented oxide superconductor having a c-axis perpendicular to said junction plane, parallel to the (110) plane of said c-axis oriented superconductors and inclined at an angle of 45 degrees with respect to the (100) plane or (010) plane of said c-axis oriented superconductors.

6,016,434

HIGH-FREQUENCY CIRCUIT ELEMENT IN WHICH A RESONATOR AND INPUT/OUPUTS ARE RELATIVELY MOVABLE

Koichi Mizuno; Akira Enokihara, both of Nara; Hidetaka Higashino, Kyoto, and Kentaro Setsune, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

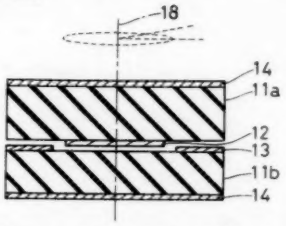
PCT No. PCT/JP95/01168, § 371 Date Dec. 17, 1996, § 102(e) Date Dec. 17, 1996, PCT Pub. No. WO95/35584, PCT Pub. Date Dec. 28, 1995

PCT Filed Jun. 9, 1995, Appl. No. 765,587

Claims priority, application Japan, Jun. 17, 1994, 6-135622

Int. Cl.[7] **H01P** *7/08*

U.S. Cl. 505—210 **9 Claims**



1. A high-frequency circuit element comprising a resonator that is comprised of an electric conductor, said resonator having two dipole modes orthogonally polarizing without energy degeneration as resonant modes, and input-output terminals, wherein said resonator and said input-output terminals are disposed on different substrates, wherein the high-frequency circuit element further comprises a mechanism that changes the relative positions of the substrate on which said resonator is disposed and the substrate on which said input-output terminals are disposed.

6,016,435

DEVICE FOR NON-INVASIVE DETERMINATION OF A GLUCOSE CONCENTRATION IN THE BLOOD OF A SUBJECT

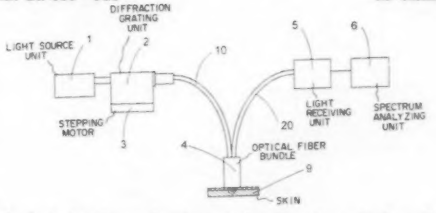
Katsuhiko Maruo, Itami; Keisuke Shimizu, Neyagawa, and Masami Oka, Osaka, all of Japan, assignors to Matsushita Electric Works Ltd., Osaka, Japan

Filed Nov. 25, 1997, Appl. No. 978,266

Claims priority, application Japan, Nov. 26, 1996, 8-314379; Jun. 25, 1997, 9-169267; Oct. 3, 1997, 9-271709

Int. Cl.[7] **A61B** *5/00*

U.S. Cl. 600—316 **22 Claims**



1. A device for performing non-invasive determination of a glucose concentration in the blood of a subject, said device comprising:

a light source for producing near-infrared radiation having successive wavelengths within a range of 1300 nm to 2500 nm;

light projecting means for projecting said near-infrared radiation on a skin of said subject;

light receiving means for receiving a resulting radiation emitted from the inside of said skin; and

spectrum analyzing means for making a spectrum analysis of the resulting radiation and determining said glucose concentration in the blood of said subject according to the spectrum analysis.

wherein

said light receiving means is separated from said light projecting means by a distance in a range of 0.1 mm to 2 mm to permit selective sensing of the resulting radiation emitted from a dermis layer positioned under an epidermis layer of said skin,

wherein said spectrum analyzing means determines said glucose concentration in the blood of said subject according to the spectrum analysis and a statistically-obtained correlation between glucose concentration in the dermis layer and glucose concentration in blood,

wherein said light projecting means is formed with a plurality of first optical fibers, each of which is connected at a first end to said light source, and provides said near-infrared radiation from an opposite projection end, and

wherein said light receiving means is formed with a plurality of second optical fibers each of which is connected at a first end to said spectrum analyzing means, and receives the resulting radiation at an opposite receiving end.

6,016,436

MEDICAL ELECTRICAL LEAD

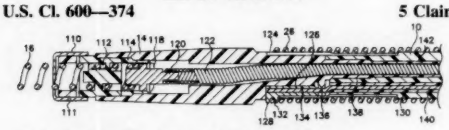
Thomas C. Bischoff, Minneapolis; Michael R. Dollimer, Burnsville, and William J. Eastman, Maple Grove, all of Minn., assignors to Medtronic, Inc., Minneapolis, Mass.

Filed Sep. 26, 1997, Appl. No. 938,269

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61B *5/04*

U.S. Cl. 600—374 **5 Claims**



1. An implantable electrical lead comprising:

an insulative rigid electrode head carrying a helical electrode;

an elongated insulative lead body less rigid than the electrode head, having a proximal end and a distal end coupled to the electrode head and carrying an inextensible conductor therein coupled to the proximal end of the lead body;

a second electrode mounted to said lead body, adjacent the electrode head; and

a conductive sleeve electrically and mechanically coupled to the inextensible conductor and to the second electrode so that proximally directed traction forces applied to the lead body are applied by the inextensible conductor directly to the electrode head.

6,016,437

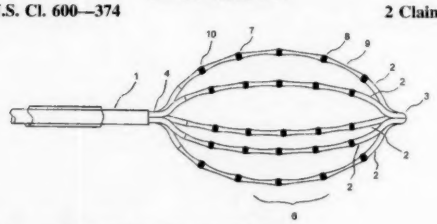
CATHETER PROBE SYSTEM WITH INFLATABLE SOFT SHAFTS

Hosheng Tu, Tustin, and Chi-Wu James Chang, Cerritos, both of Calif., assignors to Irvine Biomedical, Inc., Irvine, Calif.

Continuation-in-part of application No. 08/735,199, Oct. 21, 1996. This application Aug. 21, 1998, Appl. No. 138,455.

Int. Cl.[7] A61B *5/04*

U.S. Cl. 600—374 **2 Claims**



1. A catheter probe system comprising:

a plurality of flexible longitudinally extending shafts each having a distal end, a proximal end, and a lumen extending therebetween;

an inflatable wavy soft shaft section in at least one of the catheter shafts of the catheter probe system, wherein the outer surface of said inflatable wavy soft shaft has a plurality of hills and valleys;

a plurality of conducting electrodes secured on the hills of said inflatable wavy soft shaft;

pressurization means for inflating the inflatable wavy soft shaft, wherein said inflatable wavy soft shaft is pre-shaped to form a generally straight configuration in an uninflated state and to form a curved configuration in an inflated state;

said conducting electrodes individually encircling said inflatable wavy soft shaft and having an outermost circumferential diameter larger than the outer diameter of said at least one catheter shaft;

said valleys having an uninflated geometry wherein the uninflated diameter of the valleys is less than said outermost circumferential diameter of the conducting electrodes; and

said valleys further having an inflated geometry wherein the inflated diameter of the valleys is less than said outermost circumferential diameter of the conducting electrodes, but greater than the uninflated diameter of the valleys.

6,016,438

MPR IMAGE CREATING APPARATUS AND COAXIAL TOMOGRAM CREATING METHOD THEREIN

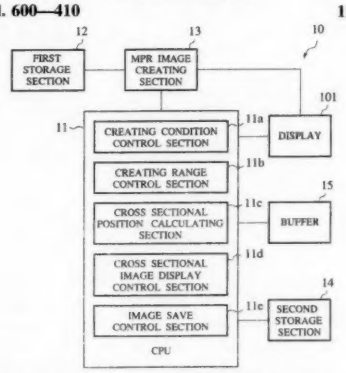
Kento Wakayama, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 20, 1997, Appl. No. 953,990

Claims priority, application Japan, Oct. 21, 1996, 8-278166

Int. Cl.[7] A61B *5/055*

U.S. Cl. 600—410 **11 Claims**



1. AN MPR image creating apparatus, comprising:

MPR image creating means for creating at least not less than two coaxial tomograms in different slice directions as MPR images;

MPR image display means for displaying the MPR images created by said MPR image creating means;

creating condition set control means for setting a creating condition of one MPR image displayed on said MPR image display means; and

coaxial tomogram creating means for creating coaxial tomograms corresponding to the MPR image whose creating condition has been set based on the creating condition set by said creating condition set control means.

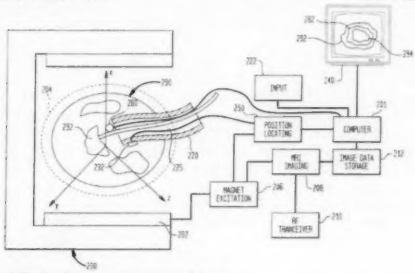
6,016,439
METHOD AND APPARATUS FOR SYNTHETIC VIEWPOINT IMAGING

David E. Acker, Setauket, N.Y., assignor to Biosense, Inc., Setauket, N.Y.

Provisional application No. 60/028,479, Oct. 15, 1996. This application Oct. 9, 1997, Appl. No. 948,267.

Int. Cl.[7] **A61B** *5/04*

U.S. Cl. 600—411 **50 Claims**



1. Medical apparatus comprising:

(a) a flexible nonimaging instrument having a distal end insertable into a patient's body during an interventional procedure;

(b) image storage means for storing image information of the patient's body obtained prior to the interventional procedure;

(c) locating means for determining the position of the distal end of the instrument within the patient's body during the interventional procedure; and

(d) image generation means for generating synthesized visual images during the interventional procedure from the previously-obtained image information and the determined position of the distal end corresponding to images that would be seen through a virtual lens disposed at a defined spatial relationship to the distal end of the instrument.

6,016,440
DEVICE FOR INFRARED (IR) SPECTROSCOPIC INVESTIGATIONS OF INTERNAL SURFACES OF A BODY

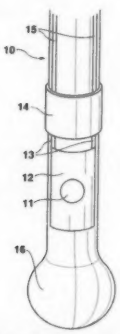
Arno Simon, Karlsruhe, and Wilfried Hartmann, Halle/Saale, both of Germany, assignors to Bruker Analytik GmbH, Rheinstetten, Germany

Filed Jul. 7, 1997, Appl. No. 889,159

Claims priority, application Germany, Jul. 29, 1996, 196 30 627

Int. Cl.[7] **A61B** *6/00*

U.S. Cl. 600—473 **18 Claims**



1. Device for an infrared (IR) spectroscopic investigation of internal surfaces of a body, e.g. of blood vessels, comprising an IR spectrometer (**1**) and an endoscope (**10**, **20**; **30**; **40**; **50***a*; **50***b*) with light guide means inside the endoscope to illuminate the internal surfaces, with means to direct IR light from the IR spectrometer (**1**) at a proximal end of the light guide means into the light guide means and at a distal end of the light guide means a detector (**12**; **22**; **32**; **42**) for detecting IR light scattered from the illuminated internal surfaces and generating corresponding electric signals, wherein the IR spectrometer is a Fourier spectrometer with an interferometer which converts the electric signals into an interferogram and by Fourier transformation into an IR spectrum and the detector (**12**; **22**; **32**; **42**) comprises a sensitive detector surface, which is larger than a light exit area at the distal end of the light guide means, wherein the light guide means comprise a glass fiber bundle (**39**; **49**; **59***a*; **59***b*) and at the distal end of the light guide means (**38**; **48**) means are provided to deflect the light by about 90°, wherein the sensitive detector surface is attached to a coating surface of the light guide means.

6,016,441
METHOD OF TESTING OPEN BUT NOT COMPLETELY VISIBLE CAVITIES

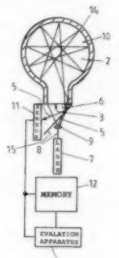
Thorsten Jens Möller, Kassel, and Karl-Aloys Bütefisch, Bovenden, both of Germany, assignors to Deutsches Zentrum fur Luft-und Raumfahrt E.V., Bonn, Germany

Filed Jan. 21, 1998, Appl. No. 10,234

Claims priority, application Germany, Jan. 27, 1997, 197 02 851

Int. Cl.[7] **G01N** *21/00*

U.S. Cl. 600—477 **19 Claims**



1. A method of testing open but not completely visible cavities having at least one entrance, comprising the steps of

directing light beams with a defined spatial light intensity distribution into one entrance of a standardized cavity from outside the cavity,

recording a spatial light intensity distribution of light beams emanating from one entrance of the standardized cavity to the outside of the cavity and saving the spatial light intensity distribution as a standard distribution,

directing the light beams with the defined spatial light intensity distribution into one entrance of the cavity to be tested from outside the cavity,

recording the spatial light intensity distribution of light beams emanating from one entrance of the cavity to be tested to the outside of the cavity, and comparing the recorded spatial light intensity distributions with the standard distribution.

6,016,442
SYSTEM FOR DISPLAYING CARDIAC ARRHYTHMIA DATA

William Hsu, Circle Pines, and Douglas J. Lang, Arden Hills, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

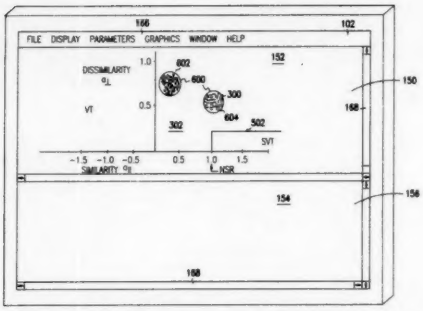
Filed Mar. 25, 1998, Appl. No. 47,647

Int. Cl.[7] **A61B** *5/04*

U.S. Cl. 600—518 **33 Claims**

1. A method comprising the steps of:

selecting a stored arrhythmic episode from a plurality of arrhythmic episodes, the stored arrhythmic episode having a plurality of complexes;



calculating a similarity value and a dissimilarity value for each complex of the plurality of complexes of the selected arrhythmic episode with respect to normal sinus rhythm complexes; and

plotting one or more symbols representing the complexes as a function of the calculated similarity values and the dissimilarity values on an interactive display screen.

6,016,443

IMPLANTABLE ISCHEMIA DETECTOR AND IMPLANTABLE STIMULATOR EMPLOYING SAME

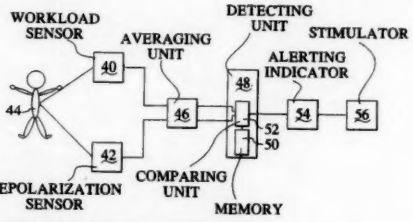
Christer Ekwall, Spånga, and Kjell Norén, Solna, both of Sweden, assignors to Pacesetter AB, Järfälla, Sweden

Filed Mar. 26, 1998, Appl. No. 48,521

Claims priority, application Sweden, Mar. 26, 1997, 9701122

Int. Cl.[7] A61B *5/04*

U.S. Cl. 600—519 **19 Claims**



1. An ischemia detector comprising:

repolarization sensing means for measuring a magnitude of a characteristic portion of a T-wave of a heart of a patient and for generating a first signal indicative of said magnitude;

workload sensing means for sensing a workload of a patient and for generating a second signal indicative of sensed workload; and

detecting means, supplied with said first and second signals, for identifying a state of ischemia upon an occurrence of a predetermined relation between the magnitude and the sensed workload.

6,016,444

AUTOMATIC CONTROL OF ANESTHESIA USING QUANTITATIVE EEG

Erwin Roy John, Mamaroneck, N.Y., assignor to New York University, New York, N.Y.

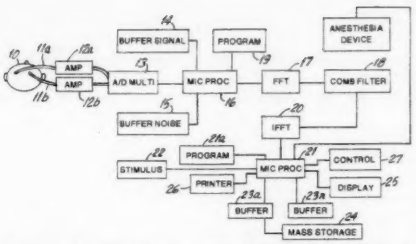
Filed Dec. 10, 1997, Appl. No. 988,076

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61N *5/00*

U.S. Cl. 600—544 **31 Claims**

1. An electroencephalograph (EEG) method using a computer system for controlling anesthesia to a patient undergoing a medical procedure, comprising:



(a) removably connecting a set of at least two EEG electrodes to the scalp of the patient, at least one EEG electrode at the front of the scalp and at least one other electrode at the back of the scalp, and administering sufficient anesthesia to the patient for the patient to attain the plane of anesthesia selected by an operator;

(b) amplifying and digitizing the ongoing brain waves of the patient after the patient is anesthetized and before being operated upon and computing power spectrum to provide an initial set of covariance matrices which are self-norm digital data representing a comparison of EEG power in at least one selected frequency band at a frontal EEG electrode with EEG power in the same band at a posterior EEG electrode and recording this initial set of covariance matrices or the average across the set in computer system memory;

(c) computing the covariance matrix of features extracted from selected EEG electrodes;

(d) during the operation, digitizing the ongoing brain waves at the same EEG electrodes and extracting the same measures to provide a current set of covariance matrices for the selected measures at the selected EEG electrodes;

(e) in the computer system, statistically comparing the initial and subsequent sets of univariate digital data and coherence matrices to specify univariate and multivariate distances between the initial set and the current set;

(f) providing a control signal if the comparison of (e) indicates that the patient is emerging from his fully anesthetized state;

(g) automatically, in response to the control signal, adjusting the anesthesia administered to the patient during the operation in response to the control signal to restore the patient to the selected plane of anesthesia.

6,016,445

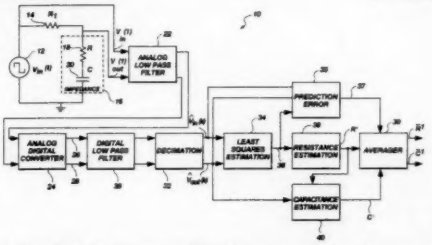
METHOD AND APPARATUS FOR ELECTRODE AND TRANSTHORACIC IMPEDANCE ESTIMATION

Gail D. Baura, San Diego, Calif., assignor to Cardiotronics, Carlsbad, Calif.

Filed Apr. 16, 1996, Appl. No. 632,878

Int. Cl.[7] A61N *1/39;* **A61B** *5/04*

U.S. Cl. 600—547 **16 Claims**



1. A method for estimating impedance, comprising the steps of:

(1) applying a square wave input voltage, $V_{in}(t)$, across a load impedance to be measured in series with a selected resistance;

(2) measuring a resulting output voltage, $V_{out}(t)$;

(3) modeling the load impedance to be measured as a resistance component in series with a capacitance component;

(4) estimating a first transfer function between $V_{in}(t)$ and $V_{out}(t)$ based on circuit analysis;

(5) estimating a second transfer function between $V_{in}(t)$ and $V_{out}(t)$ based on a standard autoregressive moving average model; and

(6) equating said first and second estimated transfer functions to derive an estimation of the respective resistance and capacitance components of the load impedance.

6,016,446

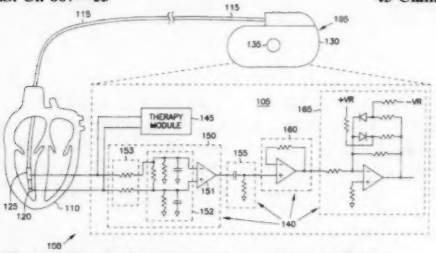
CARDIAC RHYTHM MANAGEMENT SYSTEM INCLUDING NONLINEAR, NON-BLANKING SENSE AMPLIFIER

Hugo Andres Belalcazar, Bogota, Colombia, assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Feb. 27, 1998, Appl. No. 31,989

Int. Cl.[7] A61N *1/365*

U.S. Cl. 607—13 **45 Claims**



18. A cardiac rhythm management system comprising:

first and second electrodes;

a therapy module, coupled to the first and second electrodes for delivering pacing pulses to a heart; and

a sense amplifier, including an input and an output, the input coupled to the first and second electrodes for receiving a sensed signal including a heart activity component, the sense amplifier having a nonlinear gain characteristic, wherein the input of the sense amplifier is coupled to the first and second electrodes at least during time periods in which the pacing pulses are delivered to the heart.

6,016,447

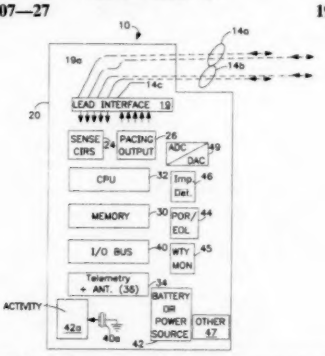
PACEMAKER IMPLANT RECOGNITION

Carleen J. Juran, Shoreview; Kristin Yakimow, Marshall; Michael B. Shelton, Minneapolis; John C. Stroebel, Blaine; H. Toby Markowitz, Roseville; Pierce Vatterott, Eagan, and Harry A. Strandquist, North Oaks, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 27, 1998, Appl. No. 181,022

Int. Cl.[7] A61N *1/37*

U.S. Cl. 607—27 **19 Claims**



1. A method of detecting implantation of an automatic, body implantable device, comprising the steps of:

(a) monitoring at least two conditions of said implantable device, each of said at least two conditions being known to change upon implantation of the device; and

(b) detecting when each of said at least two conditions changes in a manner consistent with device implantation and wherein said at least two conditions include at least one condition selected from the group: lead impedance, activity sensor output, optical measurements and temperature, and wherein said lead impedance condition is monitored for stability over a period greater than about 16 pacing pulses long.

6,016,448

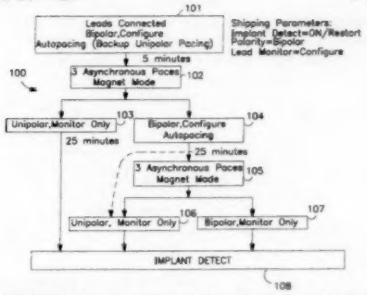
MULTILEVEL ERI FOR IMPLANTABLE MEDICAL DEVICES

James W. Busacker, St. Anthony, and Can Cinbis, Shoreview, both of Minn., assignors to Medtronic, Inc.

Filed Oct. 27, 1998, Appl. No. 179,619

Int. Cl.[7] A61N *1/378*

U.S. Cl. 607—29 **9 Claims**



1. An IMD having an automatically adjustable value for determining ERI condition of a battery power source such that said adjustable value is automatically adjusted by a value changing processor responsive to a measured level of a state of said battery power source, said measured level generated by a battery power source measuring circuit connected to said battery power source in said IMD.

6,016,449

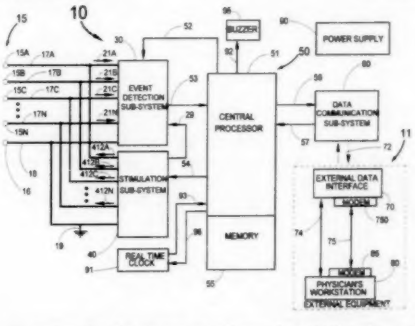
SYSTEM FOR TREATMENT OF NEUROLOGICAL DISORDERS

Robert E. Fischell, Dayton, Md.; David R. Fischell, Fair Haven, N.J., and Adrian R. M. Upton, Dundas, Canada, assignors to NeuroPace, Inc., Fair Haven, N.J.

Filed Oct. 27, 1997, Appl. No. 957,869

Int. Cl.[7] A61N *1/36*

U.S. Cl. 607—45 **53 Claims**



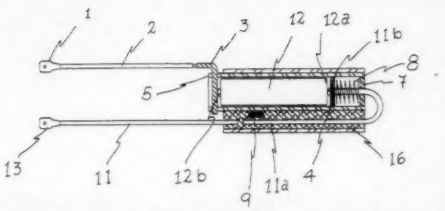
1. A system for the treatment of neurological disorders of a human patient, the system comprising:

at least two electrodes adapted to be located within the cranium of the human patient;

a control module adapted to be implanted beneath the patient's scalp for transmitting output electrical signals from the control module to the patient's brain responsive to input electrical signals received by the control module, the input electrical signals originating in the patient's brain;

electrical conducting means for providing electrical connections between the electrodes and the control module; and

external equipment means adapted to be located external to the human patient for providing two-way communication between the external equipment means and the control module for (1) receiving data transmission from the control module and (2) transmitting electrical signals to be received by the control module for defining the output electrical signals from the control module, whereby said output electrical signals provide a stimulation signal to terminate a neurological event.



skin to thereby conduct current internally into the human body, one said spaced conductive electrode wire being configured as a removable latch for confining the battery within said battery holder compartment.

6,016,450

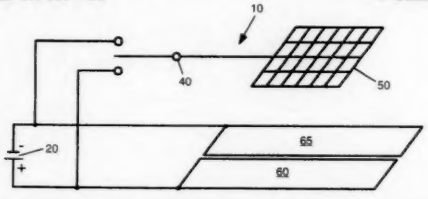
METHOD AND APPARATUS FOR STIMULATING THE HEALING OF LIVING TISSUE USING AURA THERAPY

Leander Crock, 515 West St., Caldwell, Ohio 43724

Filed Jul. 2, 1998, Appl. No. 109,397

Int. Cl.[7] A61N *1/00*

U.S. Cl. 607—50 **9 Claims**



1. A system for stimulating healing of tissue cells in a patient, comprising:

a circuit for providing intermittent low voltages of opposite polarities;

a conductive treatment surface in the circuit that contacts and supports the patient during a therapeutic application;

a conductive wire mesh electrode communicating with the circuit and adapted to be positioned an optimal distance above the tissue that is designated for treatment wherein the treatment surface comprises a pair of oppositely charged conductive plates to provide a low current electrical field for discharge of corona emanations comprising a patient's aura;

a Tesla coil and a Kirlian photography device, wherein the tissue includes an aura discharge that is visible by enhancement using the Tesla coil and Kirlian photography device, wherein the electrode position corresponds to the tissue that manifests a health disturbance in its associated aura;

and means for alternately charging and discharging the circuit to tissue cells of a patient directed to the health disturbance manifested in the aura by said Kirlian photography device.

6,016,451

NEUROLOGICAL STABILIZER DEVICE

Salvador Sanchez-Rodarte, Mina Del Eden #34 Fracc. Bernales, 98600 Guadalupe, Zacatecas, Mexico

Filed Jun. 24, 1998, Appl. No. 103,705

Int. Cl.[7] A61N *1/20*

U.S. Cl. 607—75 **3 Claims**

1. A human body treatment device comprising in combination, a battery, a battery holder compartment, a casing of conductive material enveloping the battery holder compartment containing said battery, two spaced conductive electrode wires coupled to respective positive and negative electrodes of said battery to extend outside said casing in a position for contacting human body

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6,016,452

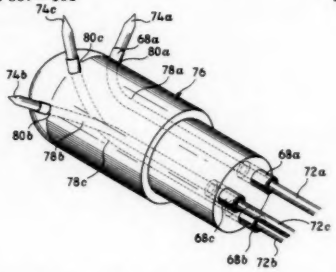
DYNAMIC HEATING METHOD AND RADIO FREQUENCY THERMAL TREATMENT

Raymond S. Kasevich, 55 Pepperell Way, York, Me. 03909

Provisional application No. 60/013,659, Mar. 19, 1996. This application Mar. 19, 1997, Appl. No. 820,111.

Int. Cl.[7] A61F *2/00*

U.S. Cl. 607—101 **21 Claims**



1. A system for the radiofrequency hyperthermia treatment of prostatic tissue, which comprises:

a transurethral applicator including:

a housing;

an elongated portion extending from the housing and dimensioned to be introduced within the urethral passage of a patient;

at least three radiofrequency bipolar electrodes supported within the elongated portion and being deployable to penetrate a urethra wall defining the urethral passage and enter prostatic tissue to define a predetermined electrode arrangement therein;

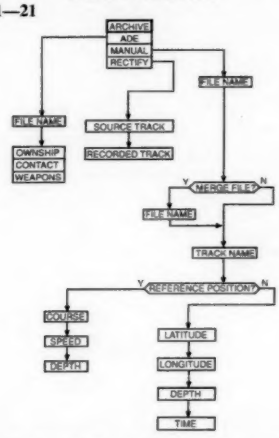
a deployment mechanism associated with the housing for deploying the at least three bipolar electrodes, the deployment mechanism including a first actuator connected to a first bipolar electrode and selectively movable to selectively deploy the first bipolar electrode and a second actuator connected to a second and a third bipolar electrode and selectively movable to selectively deploy the second and the third bipolar electrodes to control positioning of the second and third bipolar electrode relative to the first bipolar electrode; and

a radiofrequency source connected to the three bipolar electrodes for supplying radiofrequency energy such that the predetermined electrode arrangement generates a three dimensional thermal energy pattern within the prostatic tissue.

6,016,453
METHOD FOR THE COLLECTION AND REPLAY OF SUBMARINE OPERATIONAL DATA

James S. Pollock, Jr., Portsmouth, and Joan M. Cembrola, Bristol, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 21, 1997, Appl. No. 840,116
Int. Cl.[7] G06F *19/00*
U.S. Cl. 701—21 **20 Claims**



1. A method of reviewing aboard one of a multiple of naval military platforms, the operational performance of the multiple naval military platforms operating in a joint military exercise comprising the steps of:

periodically detecting and measuring selected operational parameters of at least one of said platforms;

recording said measured operational parameters as a function of time;

storing said recorded parameters within an archive library;

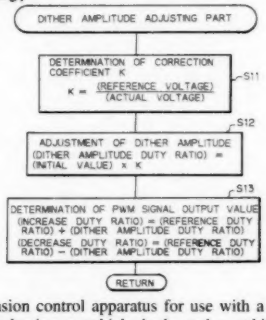
recalling said stored operational parameters from said library for subsequent display and analysis; and

transmitting said recorded operational parameters from one platform to at least one other platform.

6,016,454
SUSPENSION CONTROL APPARATUS

Nobuyuki Ichimaru, Kanagawa-ken, Japan, assignor to Tockico Ltd., Kanagawa-ken, Japan

Filed Aug. 13, 1997, Appl. No. 910,224
Claims priority, application Japan, Sep. 20, 1996, 8-271857
Int. Cl.[7] G06F *7/76*; **G06G** *7/70*
U.S. Cl. 701—37 **4 Claims**


DITHER AMPLITUDE ADJUSTING PART
DETERMINATION OF CORRECTION COEFFICIENT K
K = (REFERENCE VOLTAGE) / (ACTUAL VOLTAGE)
S11
ADJUSTMENT OF DITHER AMPLITUDE
(DITHER AMPLITUDE DUTY RATIO) = (INITIAL VALUE) × K
S12
DETERMINATION OF PWM SIGNAL OUTPUT VALUE
(INCREASE DUTY RATIO) = (REFERENCE DUTY RATIO) + (DITHER AMPLITUDE DUTY RATIO)
(DECREASE DUTY RATIO) = (REFERENCE DUTY RATIO) − (DITHER AMPLITUDE DUTY RATIO)
S13
RETURN

1. A suspension control apparatus for use with a power source and a vehicle having a vehicle body and a vehicle axle, said suspension control apparatus comprising:

PWM signal generating means for generating a PWM signal having a variable duty ratio;

a proportional solenoid valve having a solenoid and a movable member, said solenoid to be connected to the power source through switching means which is operable for switching on and off in response to the PWM signal, said movable member being operable to be displaced according to an intensity of current applied to said solenoid wherein said current applied to said solenoid includes a dither which is obtained by changing the duty ratio of the PWM signal at predetermined time intervals;

a variable damping force generating shock absorber to be provided between the vehicle body and the vehicle axle to generate a damping force which varies depending on a position of said movable member;

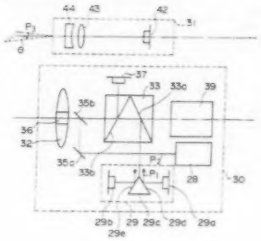
voltage detecting means for detecting a voltage impressed on said solenoid; and

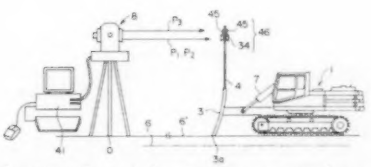
duty ratio adjusting means for adjusting the duty ratio of the PWM signal, based on a voltage value detected by said voltage detecting means, so as to maintain an amplitude of the dither at a predetermined level.

6,016,455
AUTOMATIC CONTROL SYSTEM FOR CONSTRUCTION MACHINERY

Fumio Ohtomo; Kazuaki Kimura, both of Tokyo, Japan; Vernon J. Brabec, Pleasanton, Calif.; Satoshi Hirano, Pleasanton, Calif., and Makoto Omori, Pleasanton, Calif., assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Nov. 10, 1997, Appl. No. 967,144
Int. Cl.[7] G01B *11/14*
U.S. Cl. 701—50 **10 Claims**





1. An automatic control system for a construction machine, comprising:

a ground leveling implement, a target, and a laser sensor provided in said construction machine;

a survey unit for projecting a laser beam indicating a finished-plane height toward said laser sensor, said survey unit having coordinate position measuring means for optically measuring a coordinate position of said target;

storage means for storing finished-plane height data in correspondence with a horizontal coordinate position in said coordinate position;

computation means for computing a finished-plane height at the horizontal coordinate position, based on determined finished-plane height data;

modulation means for modulating said laser beam, based on construction information at said horizontal coordinate position, and for transmitting said construction information to said laser sensor; and

demodulation means for demodulating said construction information, based on the laser beam received by said laser sensor;

wherein said survey unit is equipped with a finished-height data drive mode in which said laser beam is rotated in a vertical direction by rotation means so that a height of said laser beam at said horizontal coordinate position becomes a height from a determined finished plane and wherein said construction machine is provided with control means for controlling said ground leveling implement so that said ground leveling implement reaches said finished-plane height, based on a position at which said laser beam is received on said laser sensor, and also controlling said ground leveling implement, based on demodulated construction information.

6,016,456

SHIFT CONTROL METHOD FOR AUTOMATIC TRANSMISSIONS

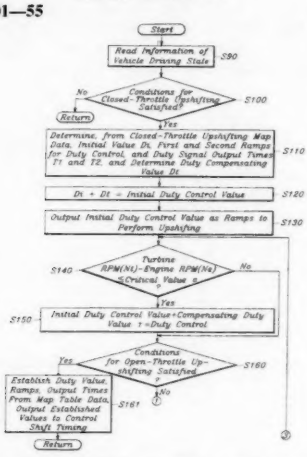
Pyunghwan Yu, Kyungki-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 17, 1997, Appl. No. 992,577

Claims priority, application Rep. of Korea, Dec. 17, 1996, 96-66482

Int. Cl.[7] **G06F** *17/00*

U.S. Cl. 701—55 **5 Claims**


Start
Read Information of Vehicle Driving State
S90
Conditions for Closed-Throttle Upshifting Satisfied?
S100
No
Return
Yes
Determine, from Closed-Throttle Upshifting Map Data, Initial Value Dt, First and Second Ramps for Duty Control, and Duty Signal Output Times T1 and T2, and Determine Duty Compensating Value Dt
S110
Dt + Dt = Initial Duty Control Value
S120
Output Initial Duty Control Value as Ramps to Perform Upshifting
S130
Turbine RPM(Nt)-Engine RPM(Ne) ≤ Critical Value α
S140
No
Yes
Initial Duty Control Value+Compensating Duty Value τ=Duty Control
S150
Conditions for Open-Throttle Up-shifting Satisfied
S160
Yes
No
Establish Duty Value, Ramps, Output Times From Map Table Data, Output Established Values to Control Shift Timing
S161
Return

1. A shift control method for automatic transmissions comprising the steps of:

determining if all conditions for performing closed-throttle upshifting are met after information of whether a vehicle is in a driving state is read;

establishing, if the conditions for closed-throttle upshifting are met, an initial duty value, first and second ramps for performing duty control, and duty signal output times, all from a closed-throttle upshifting map data, and determining a duty compensating value from a hydraulic pressure compensating map table;

adding the initial duty value and duty compensating value to calculate an initial duty control value, and outputting the initial duty control value as ramps to perform shifting;

subtracting engine RPM from turbine RPM and determining whether the resulting value is equal to or less than a predetermined critical value in a state where shifting is being performed using the initial duty control value;

adding, if the value resulting from the subtraction of engine RPM from turbine RPM is equal to or less than the critical value, a predetermined compensating duty value to the initial duty control value to increase duty control, then performing duty control to the determined ramps and shifting to a target shift range;

determining if the conditions for open-throttle upshifting are met;

determining if upshifting is completed if the conditions for open-throttle upshifting are not met;

determining, if it is determined that upshifting is completed, if a final duty control hold time, output to set shift timing, has exceeded a critical hold time; and

setting the duty value to "0" to maintain the present state of reacting and friction elements.

6,016,457

VEHICLE DRIVE FORCE CONTROLLER

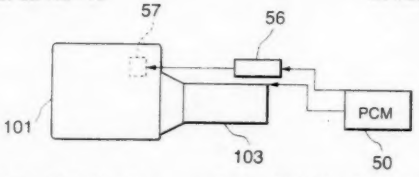
Nobusuke Toukura, Yokohama; Hiroshi Abe, and Yoshinori Iwasaki, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 19, 1997, Appl. No. 974,491

Claims priority, application Japan, Nov. 19, 1996, 8-308281; Nov. 19, 1996, 8-308333; Nov. 19, 1996, 8-308334; Nov. 25, 1996, 8-313620; Dec. 17, 1996, 8-337289

Int. Cl.[7] **B60K** *31/04*; **G06F** *7/70*

U.S. Cl. 701—70 **21 Claims**



1. A vehicle drive force controller in which drive force characteristics of a vehicle are modified according to a regional attribute of a region in which said vehicle is travelling, comprising:

a navigation device that detects the regional attribute of the region in which said vehicle is travelling;

an acceleration sensor that detects whether an acceleration pedal is depressed;

a microprocessor programmed to modify the drive force characteristics according to a change of said regional attribute when said accelerator is not depressed, while preventing the drive force characteristics from being modified when said accelerator pedal is depressed; and

a drive force control device that controls a drive force of said vehicle according to the drive force characteristics determined by said microprocessor.

6,016,458

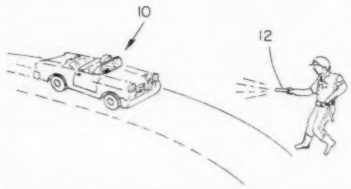
VEHICULAR SPEED MANAGEMENT SYSTEM

Alan David Robinson, Marshfield, Sewardstone Road Chingford, London, E4 7RF, United Kingdom, and William West, 4 Goldings Rise Loughton, Essex, 1G10 2QS, United Kingdom

Filed Aug. 20, 1998, Appl. No. 137,045

Int. Cl.[7] **B60K** *31/10*

U.S. Cl. 701—93 **9 Claims**



1. A vehicular speed control system comprising, in combination:

a radar gun with a speed detection mechanism and a display for depicting a speed of a vehicle at which the speed detection mechanism is directed, the radar gun further including a radio transmitter for transmitting a speed signal indicative of a user selected upper speed limit;

a speed limit sign mounted on a post with speed limit indicia printed thereon, the speed limit sign further including a transmitter powered by at least one solar cell, wherein the transmitter of the speed limit sign is adapted to continuously transmit a speed signal that is indicative of an upper speed limit that corresponds to the speed limit indicia; and

a vehicle including an acceleration control mechanism having a first mode of operation for allowing a user to control a speed of a vehicle and a second mode of operation for unconditionally imparting a low predetermined speed on the vehicle, wherein the acceleration control mechanism operates in the second mode of operation only during the receipt of a disable signal, the vehicle further including a receiver for receiving the speed signal via free space, a vehicle speed sensor for detecting a current speed of the vehicle, a storage medium for storing a maximum override speed, and a comparator having a first mode of operation upon the lack of depression of an override button for transmitting the disable signal to the acceleration control mechanism while the current speed is greater than the upper speed limit received via the speed signal, the comparator further having a second mode of operation for only a predetermined amount of time upon the instantaneous depression of an override button during which the comparator is adapted for transmitting the disable signal to the acceleration control mechanism upon the current speed being greater than the maximum override speed stored in the storage medium;

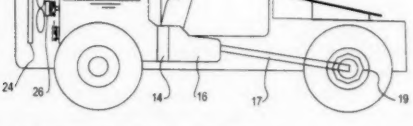
said vehicle further including a warning lamp mounted on a dash of the vehicle and connected to the comparator for illuminating during the receipt of the disable signal, an override lamp mounted on the dash of the vehicle and connected to the override button for illuminating for the predetermined amount of time upon the depression of the override button, and rear warning lights mounted on a rear of the vehicle and connected to the comparator for illuminating during the receipt of the disable signal.

6,016,459

ELECTRONIC ENGINE CONTROL SYSTEM HAVING NET ENGINE TORQUE CALCULATOR

Emad S. Isaac, and Titus J. Iwaszkiewicz, both of Woodridge, Ill., assignors to Navistar International Transportation Corp, Chicago, Ill.

Filed Jun. 23, 1998, Appl. No. 103,267
Int. Cl.[7] F02D *41/14;43/04*
U.S. Cl. 701—102 **17 Claims**



1. An automotive vehicle comprising:

a powertrain that includes a combustion engine having an output shaft powering a drivetrain to propel the vehicle:

at least one ambient parameter variable input source representing a respective ambient parameter useful in deriving gross torque output of the combustion engine;

at least one operating variable input source representing a respective operating parameter useful in deriving a reduction in gross torque output of the combustion engine due to operation of the combustion engine;

a processor for deriving net torque output of the combustion engine at the output shaft of the engine for powering the drivetrain to propel the vehicle by processing at least a respective signal correlated to the at least one ambient parameter variable input source to derive gross torque output of the combustion engine, processing at least a respective signal correlated to the at least one operating parameter variable input source to derive a reduction in gross torque output of the combustion engine due to operation of the combustion engine, and processing the derived gross torque output and the derived reduction in gross torque output to derive the net torque output; and

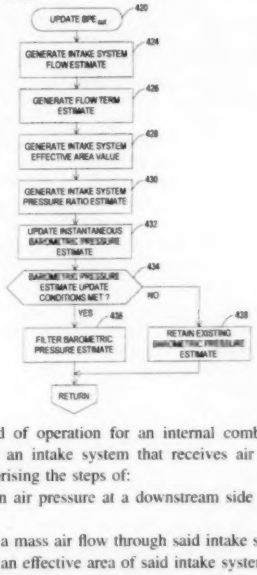
a utilization device in the drivetrain whose operation at least at times utilizes the derived net torque output.

6,016,460

INTERNAL COMBUSTION ENGINE CONTROL WITH MODEL-BASED BAROMETRIC PRESSURE ESTIMATOR

Peter M. Olin, Ann Arbor, and Peter James Maloney, New Hudson, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1998, Appl. No. 174,234
Int. Cl.[7] F02D *45/00*
U.S. Cl. 701—102 **10 Claims**



1. A method of operation for an internal combustion engine system having an intake system that receives air at barometric pressure, comprising the steps of:

measuring an air pressure at a downstream side of said intake system;

determining a mass air flow through said intake system;

determining an effective area of said intake system;

determining a temperature of the received air;

applying the measured air pressure, the determined mass air flow, the determined effective area and the determined air temperature to a mathematical model of the intake system to estimate a pressure ratio across said intake system;

computing a barometric pressure value according to a product of the estimated pressure ratio and the measured air pressure;

developing an engine system control command as a function of the computed barometric pressure value; and

controlling engine system operation in accordance with the developed control command.

6,016,461

METHOD FOR PRODUCING MAPS OF THE RISK IN POSITIONING A WELL IN AN ENVIRONMENT

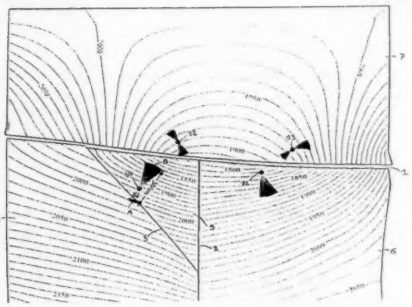
Pierre Thore, Pau, France, assignor to EIF Exploration Production, Curbevoie, France

Filed May 22, 1998, Appl. No. 82,907

Claims priority, application France, May 23, 1997, 97 06313

Int. Cl.[7] G01V *1/28*

U.S. Cl. 702—6 **15 Claims**



1. A method for producing maps of the risks in positioning a well in an environment, in which use is made of a first interpreted horizon (H_0) extracted from a seismic block migrated with at least a first value of a velocity (V) known with an uncertainty (ΔV), which consists in performing the following steps:

a) making a second interpreted horizon (H_1) by migration of the first horizon (H_0) using a second value ($V+\Delta V$) of the velocity, equal to the first value (V) plus the uncertainty (ΔV);

b) making a third interpreted horizon (H_2) by migration of the first horizon (H_0) using a third value ($V-\Delta V$) of the velocity, equal to the first value (V) less the uncertainty (ΔV);

c) selecting a positioning point (X_0) for the well on the said first horizon (H_0) and plotting a vertical (D) which passes through the said point (X_0) and intersects the second and third horizons(H_1 and H_2) at migrated points (X_1, X_2);

d) on the said first interpreted horizon (H_0), determining the positions (A, B) corresponding to the said migrated points (X_1, X_2), the portion of the first interpreted horizon (H_0) located between the said positions (A, B) constituting the locus of the potential positions of the well for the said uncertainty (ΔV).

6,016,462

ANALYSIS OF STATISTICAL ATTRIBUTES FOR PARAMETER ESTIMATION

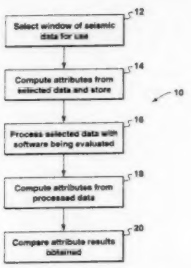
William A. Schneider, Jr.; L. Don Pham, and James R. Myron, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 29, 1997, Appl. No. 921,283

Int. Cl.[7] G06F *19/00*

U.S. Cl. 702—14 **20 Claims**

1. A method of evaluating a processing parameter value to determine the optimum setting of that parameter for processing seismic data, comprising the steps of:



forming an initial measure of a chosen seismic attribute from a selected portion seismic data of known content;

processing the selected portion of the seismic data separately for each of a set of values of the processing parameter;

storing the results of each of said separate steps of processing;

determining a value of the chosen seismic attribute for each of the stored results; and

comparing the determined values of the chosen seismic attribute with the initial measure to determine the optimum value of the parameter for processing seismic data.

6,016,463

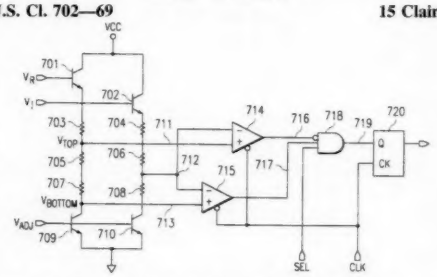
CHANNEL QUALITY MONITOR FOR READ CHANNEL IC

David Ng, Irvine, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1996, Appl. No. 702,888

Int. Cl.[7] G11B *5/09*

U.S. Cl. 702—69 **15 Claims**



1. A circuit for monitoring a channel quality comprising:

a reference level generator providing a reference window representing a plurality of reference levels;

a comparator coupled to said reference level generator to produce an output signal based upon said reference window and a channel signal;

a counter coupled to said comparator to track the number of signals from said channel that fall within said reference window;

a second reference generator providing a second reference window representing said plurality of reference levels;

a second comparator coupled to said second reference generator to produce a second output signal based upon said second reference window and said channel signal, said comparator coupled to said counter; and

a summing circuit with input terminals coupled to said reference generators and providing outputs to said counter.

6,016,464

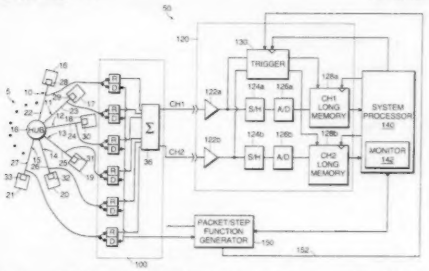
METHOD AND SYSTEM FOR CHARACTERIZING TERMINATIONS IN A LOCAL AREA NETWORK

William M. Richardson, Bolton, Mass., assignor to LeCroy Corporation, Chestnut Ridge, N.Y.

Provisional application No. 60/021,487, Jul. 10, 1996, Provisional application No. 60/029,046, Oct. 29, 1996. This application Jul. 9, 1997, Appl. No. 890,486.

Int. Cl.[7] G01R *31/11*

U.S. Cl. 702—79 **14 Claims**



1. A method for determining a length of a network cable in a computer network, comprising:

generating a predetermined signal on the network cable;

detecting a response of the cable to the predetermined signal;

analyzing the response for an influence of a terminator, the step of analyzing comprising:

calculating a first-order differential of the response as a function of delay from the generation of the predetermined signal,

determining where the first order differential indicates an inflection at a highest time delay from the predetermined signal, and

identifying the inflection as the terminator;

determining a time delay between the generation of the predetermined signal and when the influence of terminator is detected; and

calculating the length of the network cable to the terminator in response to the time delay.

6,016,465

SENSOR FAULT DETECTION SYSTEM

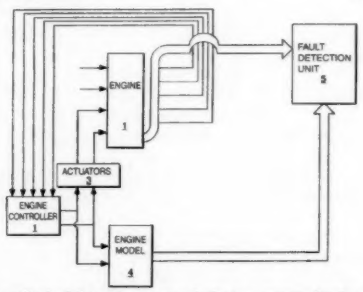
Ronald W Kelly, Farnborough, United Kingdom, assignor to The Secretary of State for Defence, Farnborough, United Kingdom

Continuation of application No. PCT/GB96/01596, Jul. 4, 1996. This application Jan. 12, 1998, Appl. No. 5,547.

Claims priority, application United Kingdom, Jul. 10, 1995, 9514008

Int. Cl.[7] G05B *9/02*; **G06F** *7/00*

U.S. Cl. 702—116 **8 Claims**



1. A method of detecting sensor faults in a system having at least one sensor providing a sensor signal for monitoring or controlling system parameters, the method comprising the following steps:

(a) generating reference signals of the system;

(b) recording the value of each sensor signal and the corresponding reference signals at time intervals;

(c) comparing the shape of an outline formed from a series of values of each sensor signal with the shape of an outline formed from a series of corresponding modified reference signals by means of a correlation coefficient;

(d) continuously updating the respective series of signals with the most recent values and

(e) declaring a fault when the correlation coefficient falls outside a prescribed range, wherein the modified reference signal is generated by:

(f) multiplying the reference signal by a scaling factor to convert each sensor signal and its corresponding reference signal;

(g) calculating the mean values of each sensor signal and its corresponding reference signal;

(h) subtracting the respective mean values from each sensor signal and its corresponding reference signal to obtain new values for each sensor signal and its corresponding reference signal;

(i) applying deviation thresholds to either side of the new values for each sensor signal;

(j) superimposing the value of each reference signal over the thresholds around the new value of its corresponding sensor signal, and

(k) formulating a modified reference signal from a hybrid of values of the new sensor signal and the new reference signal.

6,016,466

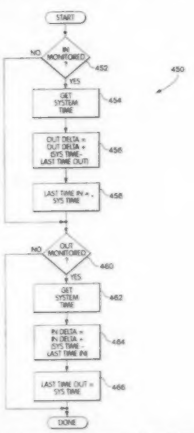
ACCURATE PROFILE AND TIMING INFORMATION FOR MULTITASKING SYSTEMS

Thomas Guinther, Nashua, and James Austin, Merrimack, both of N.H., assignors to Compuware Corporation, Farmington Hills, Mich.

Continuation-in-part of application No. 09/066,988, Apr. 23, 1998, and a continuation-in-part of application No. 08/916,125, Aug. 21, 1997, Pat. No. 5,987,249, Provisional application No. 60/046,411, May 14, 1997, Provisional application No. 60/045,018, Apr. 28, 1997, Provisional application No. 60/024,624, Aug. 27, 1996, Provisional application No. 60/036,250, Jan. 24, 1997. This application May 14, 1998, Appl. No. 79,125.

Int. Cl.[7] G06F *7/00*; *11/32*

U.S. Cl. 702—187 **24 Claims**



1. A method of determining execution time for a portion of software, comprising:

(a) obtaining a first time stamp value at a beginning of the portion while obtaining a first deltaout value for a deltaout parameter, said first deltaout value being indicative of an amount of time the portion has been swapped out prior to the first time stamp value;

(b) obtaining a second time stamp value at an end of the portion while obtaining a second deltaout value for the deltaout parameter, said second deltaout value being indicative of an amount of time the portion has been swapped out prior to the second time stamp value;

(c) adjusting at least one of the first and second time stamp values using the first and second deltaout values to compensate for any amount of time that the portion was swapped out in a multitasking operating system; and

(d) subtracting the first time stamp value from the second time stamp value to determine execution time.

6,016,467

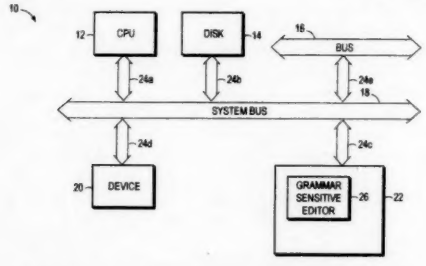
METHOD AND APPARATUS FOR PROGRAM DEVELOPMENT USING A GRAMMAR-SENSITIVE EDITOR

Gary Michael Newsted, Wilton, and Richard Eugene Ryen, Atkinson, both of N.H., assignors to Digital Equipment Corporation, Houston, Tex.

Filed May 27, 1997, Appl. No. 863,653

Int. Cl.[7] G06F *17/27*

U.S. Cl. 704—9 **38 Claims**



1. A method of performing grammar sensitive editing of user input represented by one or more tokens, said method comprising the steps of:

detecting a trigger event;

performing, in response to detection of said trigger event, lexical and syntactical analysis of said user input;

transmitting, responsive to detection of an erroneous token by said performing step, one or more valid language options for use in place of said erroneous token; and

transmitting, responsive to detection of no erroneous tokens by said performing step, one or more subsequent language options;

wherein the step of transmitting one or more language options and the step of transmitting one or more subsequent language options include transmitting a menu of one or more symbols based upon grammar rules defining syntax rules of input language, said menu including one or more first right hand side symbols corresponding to an expanded non-terminal symbol in accordance with said grammar rules defining syntax rules of said input language.

6,016,468

GENERATING THE VARIABLE CONTROL PARAMETERS OF A SPEECH SIGNAL SYNTHESIS FILTER

Daniel Kenneth Freeman; Wing-Tak Kenneth Wong, and Andrew Gordon Davis, all of Suffolk, United Kingdom, assignors to British Telecommunications Public Limited Company, London, United Kingdom

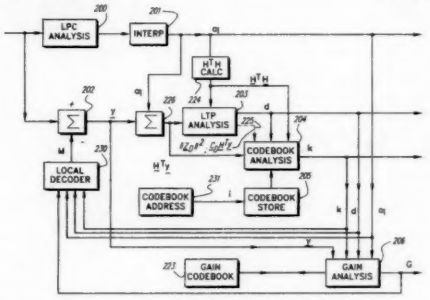
PCT No. PCT/GB91/02291, § 371 Date Jul. 27, 1993, § 102(e) Date Jul. 27, 1993, PCT Pub. No. WO92/11627, PCT Pub. Date Jul. 9, 1992

PCT Filed Dec. 20, 1991, Appl. No. 78,245

Claims priority, application United Kingdom, Aug. 23, 1991, 9118214; Dec. 21, 1991, 9027757

Int. Cl.[7] G10L *9/14*

U.S. Cl. 704—220 **5 Claims**



1. A speech signal coding apparatus comprising:

(a) means for analysing an input speech signal to generate variable control signal parameters of a speech synthesis filter; and

(b) means for selecting at least one excitation signal component from a plurality of available signal components by generating the scalar product of the response signal of the filter to an excitation signal component and the response signal of the filter to an excitation signal component, including means for forming the signal product of a filter response signal matrix H and its transpose signal matrix H^T to form a product signal matrix H^TH; said selecting means including;

(c) a first store for storing elements of the product signal matrix H^TH;

(d) a second store storing, for each pair of an excitation signal component and an excitation signal component, the address of each location in the first store which contains an element of the product signal matrix which is to be multiplied by nonzero signal elements of both excitation components of the pair; and

(e) means operable to retrieve addresses from the second store, to retrieve the signal contents of locations in the first store thereby addressed, and to add the retrieved signal contents.

6,016,469

PROCESS FOR THE VECTOR QUANTIZATION OF LOW BIT RATE VOCODERS

Pierre André Laurent, Bessancourt, France, assignor to Thomson -CSF, Paris, France

PCT No. PCT/FR96/01347, § 371 Date Mar. 5, 1998, § 102(e) Date Mar. 5, 1998, PCT Pub. No. WO97/09711, PCT Pub. Date Mar. 13, 1997

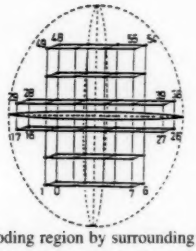
PCT Filed Sep. 4, 1996, Appl. No. 29,254

Claims priority, application France, Sep. 5, 1995, 95 10393

Int. Cl.[7] G10L *7/02*

U.S. Cl. 704—222 **20 Claims**

1. A process for the vector quantization of low bit rate vocoders, comprising:



determining a coding region by surrounding with an envelope a scatter of points of an autocorrelation matrix of reflection coefficients of a filter configured to model a vocal tract, wherein the envelope has a shape selected from the group consisting of a hyperellipsoid shape and a pyramidal shape, the envelope being centered at the barycentre of the scatter of points;

determining principal axes of the volume of points inside the envelope;

projecting area coefficients of the autocorrelation matrix onto the principal axes;

partitioning the interior volume of the envelope into elementary volumes; and

coding partition coefficients resulting from partitioning the interior volume on the basis of coordinates of said partition coefficients in a space defined by the principal axes of the volume of the points inside the envelope, while allocating as code values only values corresponding to locations of the elementary volumes in which said partition coefficients lie.

6,016,470

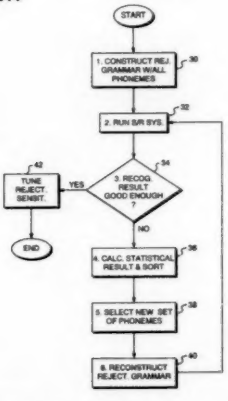
REJECTION GRAMMAR USING SELECTED PHONEMES FOR SPEECH RECOGNITION SYSTEM

Chang-Qing Shu, Billerica, Mass., assignor to Gte Internetworking Incorporated, Cambridge, Mass.

Filed Nov. 12, 1997, Appl. No. 969,031

Int. Cl.[7] **G10L** *5/06*

U.S. Cl. 704—244 **23 Claims**



1. A rejection grammar process for use in speech recognition of an utterance comprising the steps of:

selecting a digitized sub-list of phoneme models from a digitized list of phoneme models in a language,

presenting a digitized sequential representation of the utterance to the rejection grammar process, and

calculating a first set of probabilities indicating how well the digitized sequential representation of the utterance matches sequential combinations, or paths, of the digitized sub-list of phoneme models.

6,016,471

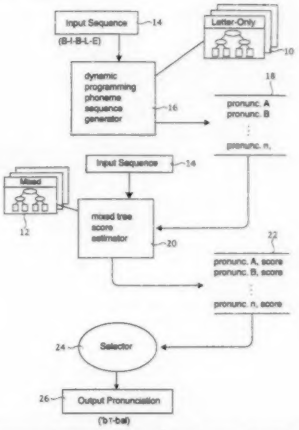
METHOD AND APPARATUS USING DECISION TREES TO GENERATE AND SCORE MULTIPLE PRONUNCIATIONS FOR A SPELLED WORD

Roland Kuhn; Jean-Claude Junqua, and Matteo Contolini, all of Santa Barbara, Calif., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 29, 1998, Appl. No. 67,764

Int. Cl.[7] **G10L** *5/04*

U.S. Cl. 704—266 **13 Claims**



1. An apparatus for generating at least one phonetic pronunciation for an input sequence of letters selected from a predetermined alphabet, comprising:

a memory for storing a plurality of letter-only decision trees corresponding to said alphabet,

said letter-only decision trees having internal nodes representing yes-no questions about a given letter and its neighboring letters in a given sequence;

said memory further storing a plurality of mixed decision trees corresponding to said alphabet,

said mixed decision trees having a first plurality of internal nodes representing yes-no questions about a given letter and its neighboring letters in said given sequence and having a second plurality of internal nodes representing yes-no questions about a phoneme and its neighboring phonemes in said given sequence,

said letter-only decision trees and said mixed decision trees further having leaf nodes representing probability data that associates said given letter with a plurality of phoneme pronunciations;

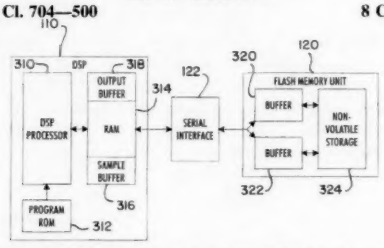
a phoneme sequence generator coupled to said letter-only decision tree for processing an input sequence of letters and generating a first set of phonetic pronunciations corresponding to said input sequence of letters;

a score estimator coupled to said mixed decision tree for processing said first set to generate a second set of scored phonetic pronunciations, the scored phonetic pronunciations representing at least one phonetic pronunciation of said input sequence.

6,016,472
SYSTEM AND METHOD FOR INTERFACING A DIGITAL AUDIO PROCESSOR TO A LOW-SPEED SERIALLY ADDRESSABLE STORAGE DEVICE

Syed S. Ali, Lehigh County, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 29, 1997, Appl. No. 939,533
Int. Cl.[7] G10L *9/14*
U.S. Cl. 704—500 **8 Claims**



1. A method of recording and storing audio data in a serially addressable flash memory unit comprising a plurality of sectors of non-volatile storage media comprising the steps of:

selecting one of a plurality of flash buffers coupled to the non-volatile storage;

sampling the audio data using a digital signal processor (DSP) connected to a random access memory (RAM);

storing the sampled audio data in a sample buffer in the RAM;

encoding the contents of the sample buffer using the DSP and saving the encoded data to an output buffer in the RAM;

when the output buffer is full, moving the contents of the output buffer to the selected flash buffer via an interface;

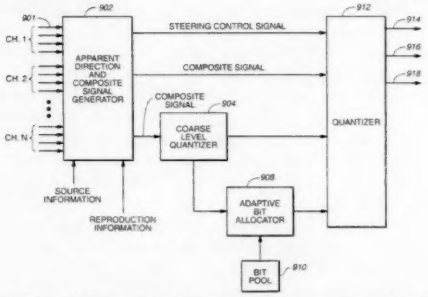
when the selected flash buffer is full, programming a sector of the non-volatile storage media with the contents of the selected flash buffer and selecting an alternate flash buffer from the plurality of flash buffers; and

repeating the sampling, storing, encoding, moving, and programming steps.

6,016,473
LOW BIT-RATE SPATIAL CODING METHOD AND SYSTEM

Ray M. Dolby, 3340 Jackson St., San Francisco, Calif. 94118

Filed Apr. 7, 1998, Appl. No. 56,503
Int. Cl.[7] G10L *3/02*
U.S. Cl. 704—500 **48 Claims**



1. A low bit-rate spatial coding system for encoding a plurality of audio streams representing a soundfield into an encoded signal and decoding said encoded signal, said system including an encoder and a decoder, said encoder comprising

means for generating a plurality of subband signals in response to said plurality of audio streams, each subband signal representing a respective frequency subband of a respective one of said audio streams,

means for generating a composite signal representing the combination of subband signals in respective frequency subbands,

means for generating a steering control signal for said composite signal indicating the principal direction of said soundfield in respective subbands,

means for generating encoded information by allocating bits to said composite signal and said steering control signal, and

means for assembling said encoded information into an encoded signal, and

said decoder comprising

means for deriving the composite signal and steering control signal from said encoded signal,

means for deriving subband signals in response to said composite signal and said steering control signal,

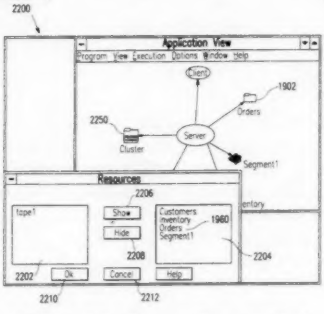
means for supplying reproduction information describing the number of output channels of said decoder and the location or virtual location of sound transducers connected to the respective output channels, wherein there are three or more output channels, and

means for generating an audio stream in no more than two output channels at any instant in response to said subband signals and reproduction information.

6,016,474
TOOL AND METHOD FOR DIAGNOSING AND CORRECTING ERRORS IN A COMPUTER PROGRAM

Thomas Dongsuk Kim, San Jose; Seth Gordon Hawthorne, Santa Cruz, and Joseph Stanley Kosinski, Woodside, all of Calif., assignors to Compaq Computer Corporation

Filed Sep. 11, 1995, Appl. No. 526,761
Int. Cl.[7] G06F *11/00*
U.S. Cl. 705—1 **21 Claims**



1. A method for debugging a software application program, comprising the steps, performed by a data processing system, of:

opening in a Graphical User Interface (GUI) a GUI window;

receiving a name of a process in the software application program, where the process is a process to be debugged;

obtaining information from the process about all resources currently being used by the process;

displaying in the GUI window a graphical process icon representing the process; and

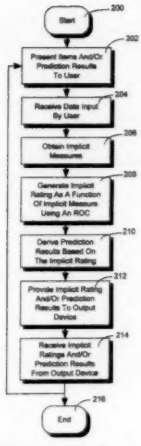
displaying in the GUI window a graphical resource icon representing a resource being used by the process.

6,016,475
SYSTEM, METHOD, AND ARTICLE OF MANUFACTURE FOR GENERATING IMPLICIT RATINGS BASED ON RECEIVER OPERATING CURVES

Bradley N. Miller, Plymouth; Joseph A. Konstan, St. Paul, and John T. Riedl, Falcon Heights, all of Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 8, 1996, Appl. No. 729,787
This patent is subject to a terminal disclaimer.
Int. Cl.[7] G06F *17/30*
U.S. Cl. 705—1 **34 Claims**

1. A collaborative filtering electronic rating broker, comprising:



(a) input means for obtaining an implicit measure concerning items presented to a user;

(b) processing means, operatively coupled to the input means, for generating an implicit rating as a function of the implicit measure using a receiver operating curve (ROC); and

(c) output means, operatively coupled to the processing means, for providing the implicit rating to collaborative filter.

6,016,476

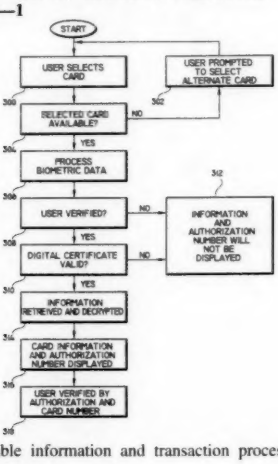
PORTABLE INFORMATION AND TRANSACTION PROCESSING SYSTEM AND METHOD UTILIZING BIOMETRIC AUTHORIZATION AND DIGITAL CERTIFICATE SECURITY

Stephane Herman Maes, Danbury, Conn., and Jan Sedivy, Praha, Czechoslovakia, assignors to International Business Machines Corporation, Armonk, N.Y.

Provisional application No. 60/055,418, Aug. 11, 1997. This application Jan. 16, 1998, Appl. No. 8,122.

Int. Cl.[7] **H04L** *9/32;* **G06F** *157/00*

U.S. Cl. 705—1 **20 Claims**



1. A portable information and transaction processing device, comprising:

a central processing unit;

a memory device, operatively coupled to said central processing unit, for storing transaction information comprising one of financial information, personal information, and a combination thereof;

communication means for establishing a communication link with a central server of a service provider, disposed at a remote location, to download a temporary digital certificate issued by said service provider;

a user interface, operatively coupled to said central processing unit, for selecting at least a portion of said transaction information;

a card reader;

a universal card having a unique card number designated to a subscribing user of said service provider, wherein the universal card is inserted into said card reader to receive said selected portion of said transaction information; and

programming means, executable by said central processing unit, for determining if said temporary digital certificate is valid, for writing said selected portion of said transaction information to said universal card if said temporary digital certificate is deemed valid, and for preventing said selected portion of said transaction information from being written to said universal card when said temporary digital certificate is deemed invalid.

6,016,477

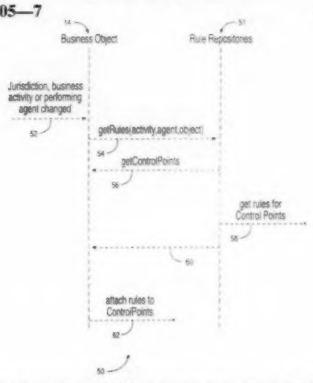
METHOD AND APPARATUS FOR IDENTIFYING APPLICABLE BUSINESS RULES

David Lars Ehnebuske, Georgetown, and Barbara Jane Alspach McKee, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1997, Appl. No. 993,718

Int. Cl.[7] **G06F** *17/60*

U.S. Cl. 705—7 **12 Claims**



1. A method, implemented in a computer system, for identifying decision points in an object-oriented object, comprising the steps of:

creating said object having a plurality of decision points in said computer system;

identifying and naming points of attachment for business rules in the operation of said object for each of said plurality of decision points;

associating by name a selected one of said plurality of decision points to at least one trigger point in said object;

assigning selected business rules to said named points of attachment for business rules in said object to said named associated decision point;

executing said object in said computer system until said at least one trigger point is detected in said object attached to said named associated decision point; and

displaying to a user in said computer the points of attachment for business rules in said object and the selected rules which have been associated with said named decision point.

6,016,478

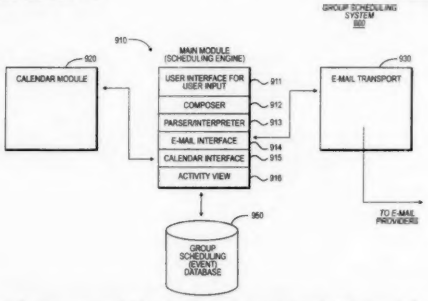
SCHEDULING SYSTEM WITH METHODS FOR PEER-TO-PEER SCHEDULING OF REMOTE USERS

Qili Zhang, Scotts Valley; Jin T. Teh, Fremont, and Philippe Richard Kahn, Scotts Valley, all of Calif., assignors to Starfish Software, Inc., Scotts Valley, Calif.

Filed Aug. 13, 1996, Appl. No. 693,677

Int. Cl.[7] B42D *5/04*

U.S. Cl. 705—9 **36 Claims**



1. In a computerized scheduling system, a method for assisting a user with scheduling calendar events in an electronic calendar, the method comprising:

(a) receiving input from the user specifying an event to schedule together with a lists of participants desired to participate in the event, at least some of said participants employing remote computer systems which are unable to interpret proprietary scheduling formats of the computerized scheduling system of the user;

(b) in response to said input, generating an electronic scheduling invitation which invites the participants to the event, said scheduling invitation being encoded in a plurality of different message formats, each message format supporting a different level of information content, said plurality of different message formats selected from a group comprising at least a proprietary scheduling format, a Hypertext Markup Language (HTML) format, and a simple electronic-mail format so that said scheduling invitation may be encoded for appropriate processing by disparate remote computer systems including those which are unable to interpret proprietary scheduling formats of the computerized scheduling system of the user;

(c) sending said scheduling invitation to each participant;

(d) upon receiving said scheduling invitation, generating an electronic scheduling reply by:

(i) decoding the message format having the highest level of information content suitable for the computer system employed by said each participant,

(ii) creating an electronic scheduling reply suitable for automatic processing by said computerized scheduling system of the user, said reply including a response indicating whether said each participant can participate in the event, and

(iii) sending said scheduling reply to said user; and

(e) upon receiving each participant's scheduling reply, automatically updating the calendar based on the response contained within the scheduling reply.

6,016,479

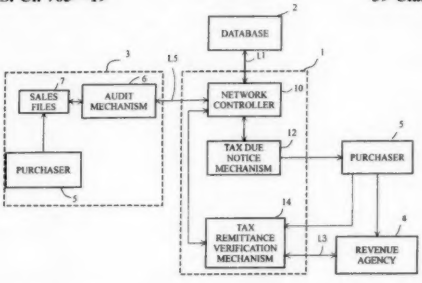
COMPUTER-BASED SYSTEM, COMPUTER PROGRAM PRODUCT AND METHOD FOR RECOVERING TAX REVENUE

Joseph F. Taricani, Jr., Corona Del Mar, Calif., assignor to Interstate Solutions, LLC, Corona Del Mar, Calif.

Provisional application No. 60/074,357, Feb. 10, 1998, Provisional application No. 60/076,502, Mar. 2, 1998, Provisional application No. 60/082,554, Apr. 21, 1998. This application May 14, 1998, Appl. No. 78,616.

Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—19 **39 Claims**



1. A computer-implemented method of recovering tax revenue for multiple jurisdictions, comprising the steps of:

populating a database hosted on a computer-readable medium with data of interstate sales transactions made by respective purchasers from the multiple jurisdictions for which no designated tax has been paid; and

sending a tax due notice to one of the respective purchasers based on the data of the sales transactions stored in the database.

6,016,480

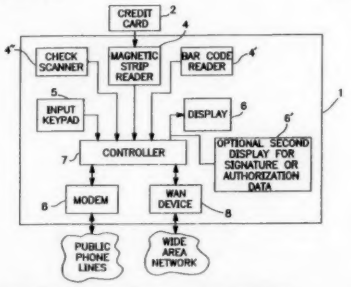
MERCHANDISE RETURN FRAUD PREVENTION SYSTEM AND METHOD

Robert C. Houvener, Nashua, and Ian P. Hoenisch, Salem, both of N.H., assignors to Image Data, LLC, Nashua, N.H.

Filed Nov. 7, 1997, Appl. No. 966,182

Int. Cl.[7] G06K *5/00;* **H04N** *7/18*

U.S. Cl. 705—21 **17 Claims**



1. A return fraud prevention system comprising:

a point of return terminal located at a point of return, said terminal having at least one input device for inputting an identifying information unit presented by a person returning at least one article of merchandise at a return location;

at least one display device located at said point of return, said at least one display device for displaying digital photographic images of persons to be identified and textual information;

at least one remote database site having stored therein a database comprising a plurality of digital photographic images for identification purposes, each said stored digital photographic image mapped to at least one identifying information unit;

a communication link linking said point of return terminal and said remote database site to interchange data between the two;

a means for verifying that a clerk present at said point of return terminal has compared any digital photographic images displayed on said point of return terminal display with the physical appearance of the person returning said merchandise and that a match exists between at least one displayed digital photographic image and the physical appearance of said person returning said merchandise; and

a return history database for storing return transaction information, including information identifying a person initiating a return transaction and information identifying a clerk responsible for processing said return transaction, as return transaction records.

6,016,481

SPACE MANAGEMENT SYSTEM

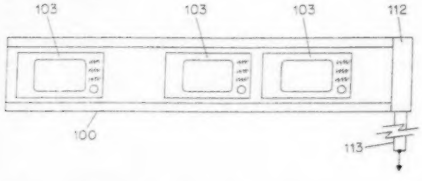
Bruce F Failing, Jr., Greenwich; Anthony P Fernandez, Ridgefield; George T Briechle, New Canaan; Edward J Fenwick, Redding, and Robert J Venable, Darien, all of Conn., assignors to Electronic Retailing Systems, Norwalk, Conn.

Continuation of application No. 08/114,510, Aug. 30, 1993, Pat. No. 5,812,985, which is a continuation of application No. 07/876,198, Apr. 30, 1992, Pat. No. 5,241,467. This application Dec. 8, 1997, Appl. No. 986,649.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06F** *17/60;7/04;* **G07G** *1/12*

U.S. Cl. 705—28 **15 Claims**



1. A space management system for use in a premises having items on shelves, the system comprising:

a first computer;

shelf set data storage means, said shelf set data storage means disposed to store information regarding a desired set of items and information regarding a desired premises location for, each item;

a plurality of rails disposed on the shelves;

a multiplicity of labels disposed on the rails;

a communications means communicatively coupling the labels with the first computer;

each rail comprising mechanical means for mechanically securing the labels;

each label comprising a display, a memory, and interface means, each label having an address, said interface means responsive to a first message communicated from the first computer for determining whether there is a match between address information in the first message and the address of the label, said interface means responsive to such a match for generating a second message communicated by the communication means to the first computer;

the first computer comprising location storage means for storing information indicative, for each label in the premises, of the location of the rail securing the label, and of an item associated with the label; and

checking means responsive to the contents of the location storage means and the contents of the shelf set data storage means for identifying information in the shelf set data storage means for which there is no corresponding information in the location storage means.

6,016,482

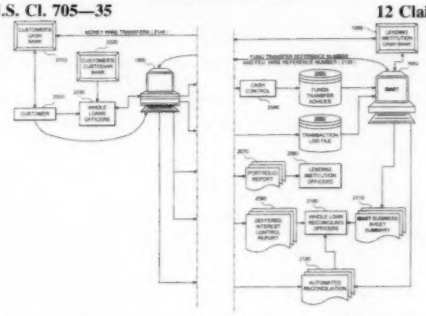
ENHANCED COLLATERALIZED FUNDING PROCESSOR

Lou Molinari, Far Hills; Steve Gooderum, South Orange, both of N.J.; Keith Peckholdt, Babylon, N.Y.; Frank DiMarco, Valhalla, N.Y.; Michael Jackson, Brooklyn, N.Y.; Ron DePoalo, Ramsey, N.J.; Sunil Makhijani, Fresh Meadow, N.Y.; Jennifer Chung, Nutley; Winnie Chou, Berkeley Height, both of N.J., and Mary Beth Gould, New York, N.Y., assignors to Merrill Lynch & Co., Inc., New York, N.Y.

Filed Jan. 11, 1996, Appl. No. 584,929

Int. Cl.[7] **G06F** *17/60*

U.S. Cl. 705—35 **12 Claims**



1. In a system for implementing, managing and tracking financial transactions within a lending institution such that users may input and process loan transactions, said system comprising:

database means for storing and retrieving transaction data;

means for processing a set of system commands and responsively causing said database means to perform any of storing, retrieving or altering said transaction data;

means for inputting transaction data into said database means,

approval means for allowing a user within said lending institution to review said transaction data and to authorize said transaction data;

means for determining if said authorized transaction data results in a funds transfer advice and for automatically generating said advice; and

means for receiving collateral data from a financial institution outside of said system and for comparing said received collateral data with said inputted transaction data and automatically outputting an error message if said data are not equal.

6,016,483

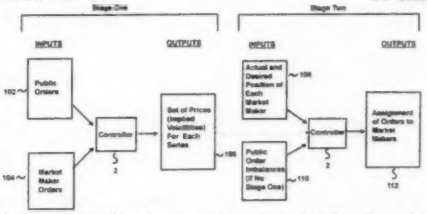
METHOD AND APPARATUS FOR AUTOMATED OPENING OF OPTIONS EXCHANGE

John T. Rickard, Durango, and William A. Lupien, Hesperus, both of Colo., assignors to Optimark Technologies, Inc., Durango, Colo.

Filed Sep. 20, 1996, Appl. No. 717,387

Int. Cl.[7] **G06F** *157/00*

U.S. Cl. 705—37 **36 Claims**



1. A computer-based system for opening trading in options, comprising:

a plurality of input devices to receive from each one of a plurality of market makers a current position, a desired target position and market maker orders for options series;

an order entry system for receiving public orders for options series; and

a controller, coupled to the plurality of input devices and the order entry system, the controller comprising

(a) means for determining a set of prices for each options series that will maximize a weighted volume of trades across all option series at the opening,

(b) means for executing all orders that can occur at the set of prices,

(c) means for determining a residual imbalance of non-executed public orders, and p2 (d) means, utilizing the current position and the desired target position of each one of the plurality of market makers, for assigning the residual imbalance of non-executed public orders to individual ones of the plurality of market makers so as to minimize a cumulative measure of deviation between the desired target position and the current position of each market maker.

6,016,484

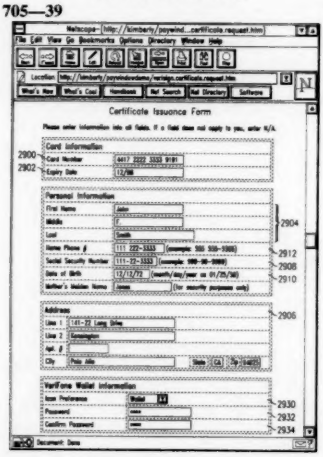
SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR NETWORK ELECTRONIC PAYMENT INSTRUMENT AND CERTIFICATION OF PAYMENT AND CREDIT COLLECTION UTILIZING A PAYMENT

Humphrey Williams, Palo Alto; Kevin Hughes, San Mateo, and Bipinkumar G. Parmar, Cupertino, all of Calif., assignors to VeriFone, Inc., Santa Clara, Calif.

Filed Apr. 26, 1996, Appl. No. 639,880

Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—39 **21 Claims**



1. A method for obtaining a certificate for a payment instrument by using a first computer with an attached display connected by a network to a second computer, comprising the steps of:

(a) displaying a certificate request form for the payment instrument on the display of the first computer for entry of one or more data elements;

(b) detecting completion of data entry into the certificate request form;

(c) assembling a request for the certificate using the one or more data elements;

(d) transmitting the request for the certificate to the second computer;

(e) creating the certificate for the payment instrument at the second computer;

(f) generating a payment instrument holder containing the payment instrument at the second computer; and

(g) delivering the certificate and the payment instrument holder to the first computer.

6,016,485

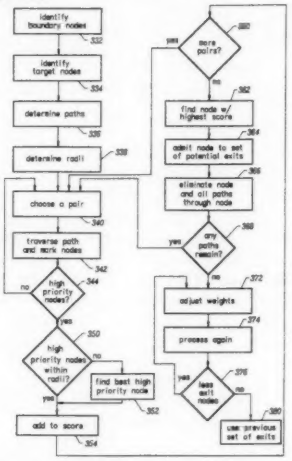
SYSTEM FOR PATHFINDING

Koji Amakawa, San Jose, and Edward Joseph Suranyi, Union City, both of Calif., assignors to Etak, Inc., Menlo Park, Calif.

Filed Feb. 13, 1998, Appl. No. 23,504

Int. Cl.[7] G06F *17/00*

U.S. Cl. 705—400 **49 Claims**



1. A method for determining a path in a processor readable representation of a network from an origin to a destination, said processor readable representation of said network including one or more tiles, the method comprising the steps of:

determining whether said origin and said destination are located in a single tile;

determining whether said origin and said destination are located in tiles within a proximity threshold of each other;

performing a first path exploration with a processor to determine said path using a first set of one or more webs, if said origin and said destination are located in a single tile;

performing a second path exploration with said processor to determine said path using a second set of one or more webs, if said origin and said destination are located in tiles within said proximity threshold of each other;

performing a third path exploration with said processor to determine said path using a third set of one or more webs, if said origin and said destination are located in separate tiles not within said proximity threshold of each other; and

reporting said path.

6,016,486

SYSTEM METHOD AND ARTICLE OF MANUFACTURE FOR A GOAL BASED SYSTEM UTILIZING AN ACTIVITY TABLE

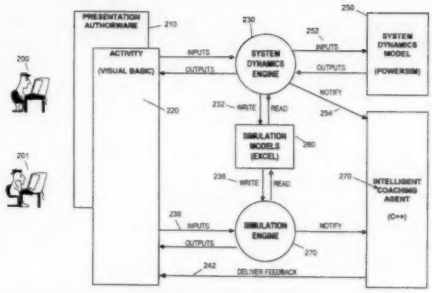
Mark Stewart Nichols, Downers Grove, Ill., assignor to AC Properties B.V., Netherlands

Filed Dec. 22, 1998, Appl. No. 218,968

Int. Cl.[7] G06F *17/00*

U.S. Cl. 706—47 **19 Claims**

1. A method for creating a presentation, comprising the steps of:



(a) receiving information indicative of a goal;

(b) integrating information that motivates accomplishment of the goal for use in the presentation;

(c) managing information flow utilizing a linked list; and

(d) evaluating progress toward the goal and providing feedback that further motivates accomplishment of the goal.

6,016,487

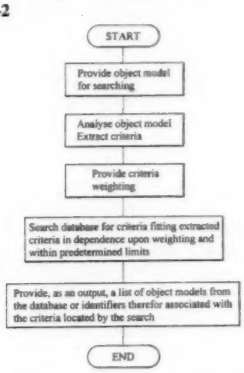
METHOD OF SEARCHING THREE-DIMENSIONAL IMAGES

Marc Rioux, Ottawa, and Eric Paquet, Thetford Mines, both of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Mar. 26, 1997, Appl. No. 824,289

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—2 **23 Claims**


START
Provide object model for searching
Analyse object model Extract criteria
Provide criteria weighting
Search database for criteria fitting extracted criteria in dependence upon weighting and within predetermined limits
Provide, as an output, a list of object models from the database or identifiers therefor associated with the criteria located by the search
END

1. A method of locating a three-dimensional model of an object comprising the steps of:

providing a first three-dimensional search model of an object, the three-dimensions being three spatial dimensions;

determining values corresponding to the first three-dimensional model that are substantially rotationally and translationally invariant in the three spatial dimensions; and,

using a processor, searching for three-dimensional models, the models comprising data relating to each of three spatial dimensions, in a database associated with similar substantially rotationally and translationally invariant values within predetermined limits to those of the first model.

6,016,488

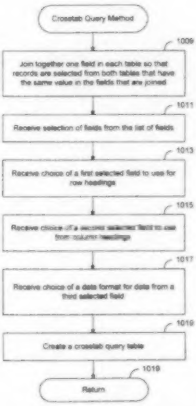
METHOD AND SYSTEM FOR CONSTRUCTING QUERIES

Adam Bosworth, Mercer Island; Ross A. Hunter, Woodinville, and David J. Habib, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of application No. 08/788,593, Jan. 22, 1997, which is a continuation of application No. 08/116,888, Sep. 2, 1993, Pat. No. 5,619,688. This application Nov. 4, 1998, Appl. No. 186,136.

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—4 **22 Claims**


Crosstab Query Method
1009
Join together one field in each table so that records are selected from both tables that have the same value in the fields that are joined
1011
Receive selection of fields from the list of fields
1013
Receive choice of a first selected field to use for row headings
1015
Receive choice of a second selected field to use from column headings
1017
Receive choice of a data format for data from a third selected field
1019
Create a crosstab query table
1019
Return

1. A method in a computer system for visually indicating joining a first table with a second table, each table having a plurality of fields, each field having a field name, the computer system having a display device, the method comprising:

displaying on the display device the field names of the fields of the first table;

displaying on the display device the field names of the fields of the second table;

receiving from a user a selection of a displayed field name of the first table and of a displayed field name of the second table, the selection indicating that the first table and the second table are to be joined by the fields with the selected field names; and

displaying on the display device a join indicator between the selected field names to indicate that the tables are to be joined by the fields of the selected field names

wherein the displaying of the field names displays the field names in a scrollable list box.

6,016,489

METHOD AND APPARATUS FOR CONSTRUCTING STABLE ITERATORS IN A SHARED DATA COLLECTION

Ken M. Cavanaugh, Montara, and Christian J. Callsen, Redwood City, both of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

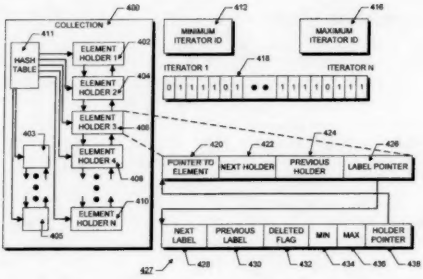
Filed Dec. 18, 1997, Appl. No. 993,205

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—8 **33 Claims**

1. Apparatus for making stable an iterator which is created to iterate over a collection of elements that is stored in a memory, said collection being shared by a plurality of threads which add such elements and mark such elements in the collection for deletion, the apparatus comprising:

a mechanism which associates a label with each element that is added to the collection after the iterator is created wherein the label indicates that the added element is not deleted and invisible to the iterator; and



a mechanism for deleting one such element from the collection when the element is marked for deletion and the label for the marked element indicates that the marked element is invisible to the iterator.

6,016,490

DATABASE MANAGEMENT SYSTEM

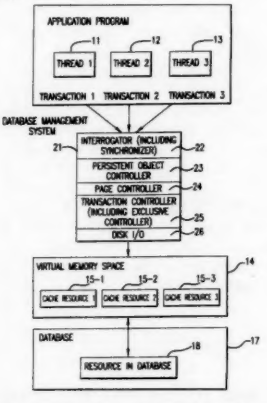
Yoshiki Watanabe; Kei Tanaka, and Hiroshi Hayata, all of Nakai-machi, Japan, assignors to Fuji Xerox Co., Ltd.

Filed Jan. 30, 1998, Appl. No. 16,487

Claims priority, application Japan, Feb. 5, 1997, 9-036993; May 6, 1997, 9-131690

Int. Cl.[7] **G06F** *17/30*

U.S. Cl. 707—8 **12 Claims**



4. A database management system for enabling operation of a plurality of application programs in a multi-thread environment with a resource on a database handled as a cache resource on a virtual memory space, comprising:

a simultaneous processing function of securing an execution right to any thread relative to the cache resource; and

an exclusive control function of securing a lock for a transaction operating on a thread for which an execution right is secured relative to the resource on the database corresponding to the cache resource;

said simultaneous processing function and said exclusive control function respectively constituted as a synchronized object and an exclusive control object,

wherein said synchronized object exclusively secures an execution right to a thread by a unit of resource for which a lock is secured, and thereby said synchronized object and said exclusive control object execute exclusive control of the execution right and exclusive control of the lock on a one-to-one basis.

6,016,491

GENERIC FILE FORMAT FOR MULTIPLE SECURITY REQUIREMENTS

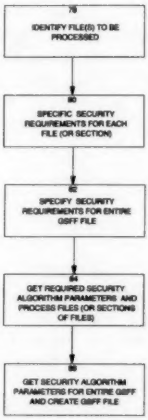
Weidong Kou, Scarborough, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 7, 1997, Appl. No. 781,465

Claims priority, application Canada, Jul. 29, 1996, 2182254

Int. Cl.[7] **G06F** *17/30;* **H04L** *9/00*

U.S. Cl. 707—9 **19 Claims**


78
IDENTIFY FILE(S) TO BE PROCESSED
80
SPECIFIC SECURITY REQUIREMENTS FOR EACH FILE (OR SECTION)
82
SPECIFY SECURITY REQUIREMENTS FOR ENTIRE GBFF FILE
84
GET REQUIRED SECURITY ALGORITHM PARAMETERS AND PROCESS FILES (OR SECTIONS OF FILES)
86
GET SECURITY ALGORITHM PARAMETERS FOR ENTIRE GBFF AND CREATE GBFF FILE

1. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for preparing secure file packaging, said method steps comprising:

identifying file components to be packaged together;

specifying security requirements for each said file component;

specifying security requirements for the secure file packaging;

obtaining parameters for the security requirements for each said file component, calling security functions associated with the security requirements associated with each said file component, and processing each said file component;

obtaining parameters for the security requirements for the secure file packaging and calling security functions associated with the security requirements associated with the secure file packaging; and

creating a securely packaged file, wherein said creating step further comprises the steps of:

formatting a file header for said securely packaged file, wherein said header identifies a beginning and a length of said securely packaged file;

reformatting said processed file components to provide (a) at least one data file containing said processed file components in said securely packaged file, wherein a portion of said data file is in a secured form and (b) a file body in said securely packaged file for each of said processed file components, wherein each of said file bodies contains a pointer to said processed file component within said data file and security protections for said processed file component; and

formatting a file trailer for said securely packaged file, wherein said trailer provides security protection for said securely packaged file.

6,016,492

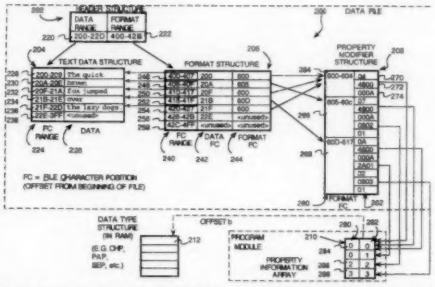
FORWARD EXTENSIBLE PROPERTY MODIFIERS FOR FORMATTING INFORMATION IN A PROGRAM MODULE

Catherine J. Saxton; Thomas W. Saxton, both of Issaquah, and Mark John Walker, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jul. 15, 1997, Appl. No. 893,939

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—100 **8 Claims**



1. An improved method of formatting information in a program module operative in a computer system, comprising the steps of:

storing a property information array stored in association with a program module, the property information array comprising formatting information for applying to data elements in a computer file upon which the program module is operative for manipulating;

providing a data structure for storing data elements corresponding to the data to be formatted;

providing a property modifier structure for storing groups of data formatting property modifiers and corresponding arguments that represent the appearance of the data elements;

providing a data format structure for storing linking information that associates the data elements with corresponding groups of data formatting property modifiers,

in response to an output display device command with respect to a selected data element in the data structure, accessing the data formatting structure to determine the location in the property modifier structure of a selected one of the groups of the data formatting property modifiers corresponding to the selected data element, each data formatting property modifier having a corresponding property modifier argument and comprising an index field including an index into the property information array associated with the program module; and

displaying the selected data element in accordance with the formatting information obtained in response to accessing the property information array with each index of the data formatting property modifiers in the selected group of data formatting property modifiers.

6,016,493

METHOD FOR GENERATING A COMPRESSED INDEX OF INFORMATION OF RECORDS OF A DATABASE

Michael Burrows, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of application No. 08/695,906, Aug. 9, 1996, Pat. No. 5,745,898. This application Apr. 3, 1998, Appl. No. 54,431.

This patent is subject to a terminal disclaimer.

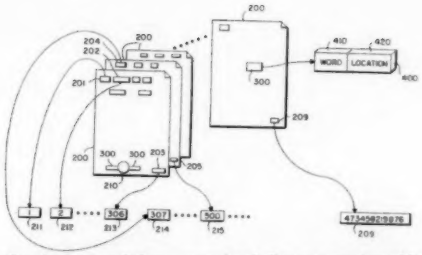
Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—101 **13 Claims**

1. A computer implemented method for generating a compressed index of information, the information represented by a plurality of information portions, the method comprising the steps of:

encoding a representation of a first of the plurality of information portions; and

storing the encoded representation of the first of the plurality of information portions in the index of information;



wherein the encoded representation indicates a number of bytes that the first of the plurality of information portions has in common with a representation of a second of the plurality of information portions and bytes that differ between the first of the plurality of information portions and a representation of the second of the plurality of information portions.

6,016,494

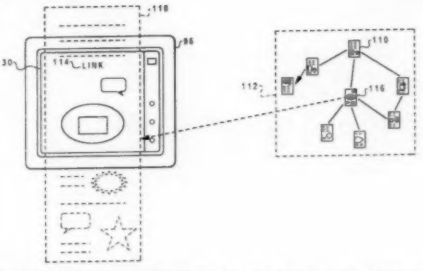
EXPANDING WEB DOCUMENTS BY MERGING WITH LINKED DOCUMENTS

Scott Harlan Isensee, Georgetown; Rick Lee Poston; I-Hsing Tsao, both of Austin, and Richard Edmond Berry, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1997, Appl. No. 976,170

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—102 **18 Claims**



1. A method of accessing electronic information, comprising the steps of:

loading an original document onto a data processing system;

selecting, at the data processing system, a link embedded in the original document, the link being associated with a linked document; and

creating a new document by merging the linked document with the original document, in response to said selecting step.

6,016,495

OBJECT-ORIENTED FRAMEWORK MECHANISM FOR PROVIDING PERSISTENT STORAGE

Michael D. McKeehan, and Erik E. Voldal, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1997, Appl. No. 934,230

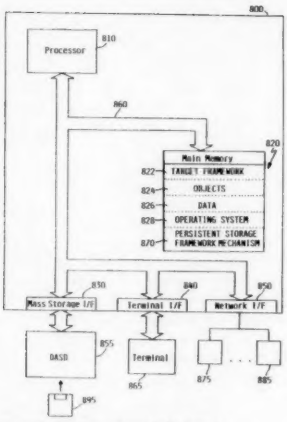
Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—103 **55 Claims**

1. An apparatus comprising:

at least one processor; and

a memory coupled to the at least one processor, the memory containing an object-oriented framework mechanism that provides at least one persistent storage environment, the framework mechanism executing on the at least one processor, the framework mechanism comprising:



a container configuration class defining:

at least one container configuration object that contains configuration data corresponding to at least one of a plurality of persistent containers; and

a second set of object methods to return the name of the persistent container and to identify at least one object that contains additional information regarding the persistent storage environment;

a container class configuration class defining:

at least one container class configuration object that contains configuration data for at least one class in at least one persistent container that defines which classes the at least one persistent container supports;

a container store configuration class defining:

at least one container store configuration object that contains configuration data that defines a container store that represents an extent of storage that a persistent container has configured to use.

6,016,496

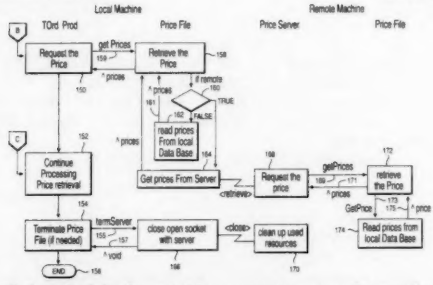
METHOD AND APPARATUS FOR AN OBJECT-ORIENTED OBJECT FOR RETRIEVING INFORMATION FROM LOCAL AND REMOTE DATABASES

Kenneth Wayne Roberson, North Richland Hills, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1997, Appl. No. 974,837

Int. Cl.[7] **G06F** *15/163*

U.S. Cl. 707—103 **15 Claims**



1. A method, implemented in a computer system, for creating an object-oriented object for retrieving information from a local and remote source, comprising the steps of:

creating said object in said computer system at a client having an interface instanced with primitives;

sending messages by an application to said object at said client in said computer system using said primitives, said application having a class utilizing said object to retrieve said information;

identifying a first request by said object at said client for said information on said local source on said computer at said client and continuing a normal sequence of operations at said client for said information in said computer system for standalone operation; and

identifying a second request by said object at said client for said information on said remote source on said computer on a server and initiating communications with said server on said remote source to satisfy said second request.

6,016,497

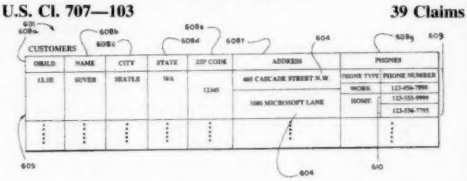
METHODS AND SYSTEM FOR STORING AND ACCESSING EMBEDDED INFORMATION IN OBJECT-RELATIONAL DATABASES

Christopher Allen Suver, Seattle, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Dec. 24, 1997, Appl. No. 998,334

Int. Cl.[7] **G06F** *17/30*

U.S. Cl. 707—103 **39 Claims**



1. A method for storing and accessing information in an object-relational database stored in a computer system, the object-relational database comprising one or more tables, the tables each having a table name and comprising one or more rows of information, the method comprising the computer-implemented steps of:

storing a plurality of data elements in a row of information, the row comprising one or more columns, the columns each having a column name, at least one of the columns being an embedded-data column for storing a plurality of the data elements;

receiving a database command for accessing a selected data element, the database command comprising a selected table name and an extension corresponding to a selected column name representing the embedded-data column; and

in response to receiving the database command, accessing a table represented by the selected table name;

in response to accessing the table, accessing the embedded-data column represented by the selected column name; and

in response to accessing the embedded-data column, accessing the selected data element,

whereby a plurality of data elements may be stored in the embedded-data column and, by way of the extension to the database command, may subsequently be accessed from the

embedded-data column as if the embedded-data column were a separate table.

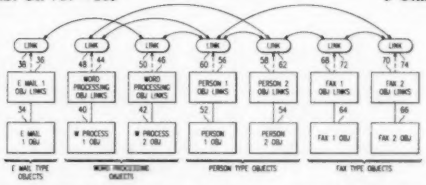
6,016,498
OBJECT ORIENTED ARCHITECTURE WITH BIDIRECTIONAL LINKING OF RELATIONSHIPS BETWEEN OBJECTS

Stephen Peter Bakke, 5353 Keller Springs Rd., Apt. 311, Dallas, Tex. 75248; William R. Lovin, P.O. Box 307, Allen, Tex. 75002; Patrick E. Dobyns, 1726 Parkhurst, Garland, Tex. 75040, and John Martindale, 5819 Bent Creek Trail, Dallas, Tex. 75252

Continuation of application No. 08/610,693, Mar. 4, 1996, Pat. No. 5,787,440. This application Jul. 28, 1998, Appl. No. 123,573.

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—103 **3 Claims**



1. A method for linking objects in an object-oriented system, comprising the steps of:

defining a plurality of objects in the system by the steps of:

partitioning the system into a plurality of portions, each portion comprising an object and each object associated with a defined functionality in the system,

associating a unique object identification number with each of the objects, and

defining parameters of each object and the associated portion and storing the defined parameters in a table associated with the unique ID number of the object, and associating each table with the associated object;

creating relationships between any of the objects in the system and storing the created relationships in the associated table of all of the objects having the relationship;

accessing one of the objects and the associated table;

viewing the relationships in the associated table to other objects; and

accessing via the relationships any of the objects contained within the table and having the relationship which is defined in the associated table of the accessed one of the objects.

6,016,499
SYSTEM AND METHOD FOR ACCESSING A DIRECTORY SERVICES RESPOSITORY

Daniel T. Ferguson, Orem, Utah, assignor to Novell, Inc., Provo, Utah

Provisional application No. 60/038,747, Feb. 20, 1997. This application Jul. 21, 1997, Appl. No. 897,526.

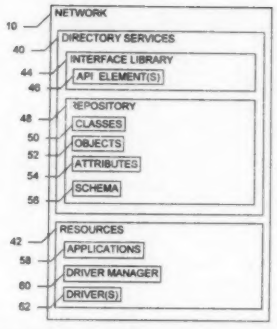
Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—104 **69 Claims**

1. A system providing access to a directory services repository which is stored on a computer system, the claimed system comprising:

a directory services application programming interface, also known as the API, which includes at least one callable element that is capable of accessing a component of the directory services repository in response to being called; and

a driver which is capable of translating a relational database language statement into an executable API sequence that includes a call to the callable element and produces an API result, the driver also being capable of translating the API result into a relational database result,



wherein the directory services repository component includes an effective class and an object having a context the relational database language statement identifies a table and a subset restriction, and the driver and the API together map the effective class to the table and also map the context to the subset restriction.

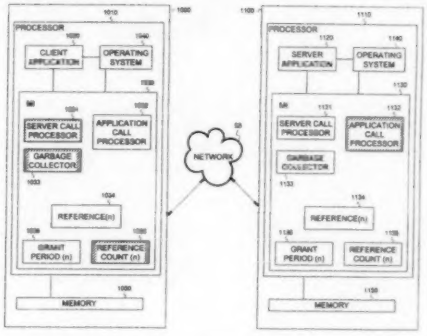
6,016,500
LEASING FOR FAILURE DETECTION

James H. Waldo, Dracut; Ann M. Wollrath, Groton; Robert Scheifler, Somerville, and Kenneth C.R.C. Arnold, Lexington, all of Mass., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Continuation-in-part of application No. 08/729,421, Oct. 11, 1996, Pat. No. 5,832,529. This application Mar. 20, 1998, Appl. No. 44,916.

Int. Cl.[7] G06F *11/00*

U.S. Cl. 707—202 **1 Claim**



1. A method in a data processing system having a client and a server, comprising the steps of:

requesting a lease by the client from the server to use a resource managed by the server, the lease request containing a first recovery routine;

granting the lease by the server so that the client can utilize the resource for a period of time and sending a second recovery routine to the client;

utilizing the resource by the client;

determining by the client when the period of time is near expiration;

sending a request to the server to renew the lease when the client determines that the lease is near expiration;

determining whether the renew request is successful;

invoking the second recovery routine by the client to perform failure recovery for the server when the client determines that the renew request is unsuccessful;

determining by the server when the lease has expired;

invoking the first recovery routine by the server when the lease has expired to perform failure recovery for the client.

6,016,501

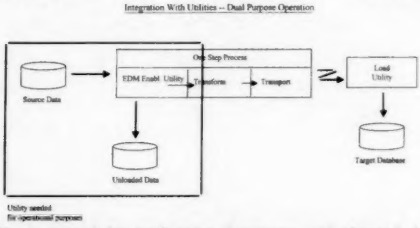
ENTERPRISE DATA MOVEMENT SYSTEM AND METHOD WHICH PERFORMS DATA LOAD AND CHANGED DATA PROPAGATION OPERATIONS

James L. Martin, Round Rock; Abolfazl Sirjani, Austin; Kevin D. Seppi, Austin, and Lisa S. Keeler, Austin, all of Tex., assignors to BMC Software, Houston, Tex.

Provisional application No. 60/078,449, Mar. 18, 1998. This application Mar. 30, 1998, Appl. No. 50,609.

Int. Cl.[7] **G06F** *17/30*

U.S. Cl. 707—203 **48 Claims**



21. A method for performing data move and changed data propagation operations in an enterprise computing system, wherein the enterprise computing system comprises a plurality of computer systems and includes a source database and a target database, wherein the enterprise computing system also includes a changed data log for storing changed data of the source database, the method comprising:

initiating a bulk data move task from the source database to the target database;

performing the bulk data move task, wherein said performing the bulk data move task comprises:

determining the status of an apply process of a changed data propagation task;

providing information to the apply process regarding the bulk data move task;

wherein the apply process suspends apply processing in response to said providing if the apply process is active;

loading data into at least a portion of the target database;

updating control information of the apply process, wherein said updating includes providing information regarding a restart point in a changed data log;

restarting the changed data propagation task after said loading and said updating control information;

repositioning the changed data propagation task to a correct location within the changed data log in response to said updated control information.

6,016,502

DATA PROCESSING APPARATUS

Isamu Haneda, Kyoto, Japan; Yoshiro Kihara, Hamburg, Germany, and Masami Morioka, Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 25, 1996, Appl. No. 684,851

Claims priority, application Japan, Jul. 28, 1995, 7-193801

Int. Cl.[7] **G06F** *15/00*; **G09G** *3/36*

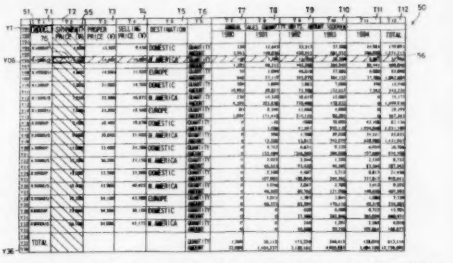
U.S. Cl. 707—509 **25 Claims**

1. A data processing apparatus, comprising:

memory for storing information grouped into plural groups;

inputting means for designating a group out of said plural groups;

display for displaying information of said plural groups, the display including a display memory for storing contents which are to displayed; and



control means for responding to an output from said inputting means, for selectively deleting information of the group designated out of said plural groups by said inputting means, so that only information of the remaining groups are displayed on the display,

said control means further for moving information of the remaining groups stored in the display memory into a space in the display memory previously occupied by the information of the deleted group, so that plural parts of the information of the remaining groups are closer to each other, and

said control means still further for displaying an identifier which expresses a position of the deleted group together with the remaining groups on the display,

wherein the information of the deleted group, retrieved from the memory, is inserted and restored into the information of the remaining groups by the inputting means, and displayed by the display.

6,016,503

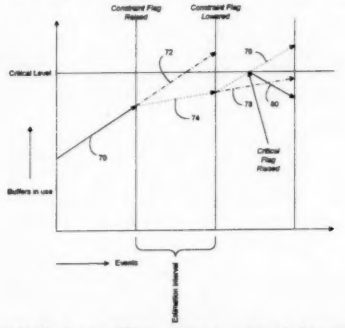
METHODS, SYSTEMS AND COMPUTER PROGRAM PRODUCTS FOR PREEMPTIVE AVOIDANCE OF CONSTRAINTS FOR SHARED RESOURCES

Linwood Hugh Overby, Jr., Raleigh, and Balachandar Rajaraman, Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1997, Appl. No. 920,975

Int. Cl.[7] **G06F** *9/00*

U.S. Cl. 709—104 **30 Claims**



1. A method of controlling access to a shared data processing resource in a data processing system, the method comprising the steps of:

predicting future utilization of the shared data processing resource based upon a rate of change of utilization of the shared data processing resource determined from historical utilization of the shared data processing resource over a predefined number of events or predetermined time intervals; and

notifying users of the shared data processing resource of a potential future shortage of the shared data processing resource by setting a critical flag if the current utilization of the shared resource reaches a predefined maximum utilization

value, and by setting a constraint flag if said step of predicting predicts that the utilization of shared data processing resource will be greater than the predefined maximum utilization value of the shared resource.

6,016,504

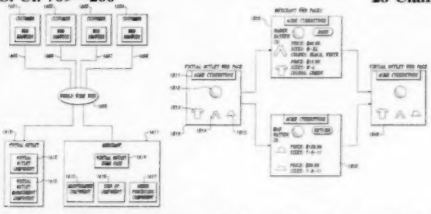
METHOD AND SYSTEM FOR TRACKING THE PURCHASE OF A PRODUCT AND SERVICES OVER THE INTERNET

John K. Arnold, Kent; John R. Bennett, Seattle; Peter O. Claar, Seattle; Kurt D. Dahl, Seattle; Jennifer L. Dobson, Seattle; Charles A. Fontaine, Seattle; Philip H. Johanson, Seattle; Donald G. McGuire, Mount Vernon; Mary Swanson, Edmonds; David G. Wagner, Issaquah, and Steve Wainright, Seattle, all of Wash., assignors to InfoSpace.com, Inc., Redmond, Wash.

Filed Aug. 28, 1996, Appl. No. 704,143

Int. Cl.[7] G06F *17/60;17/30*

U.S. Cl. 709—200 **28 Claims**



1. A method for tracking a purchase of a product supplied by merchant; the purchase being made by a customer through a virtual outlet; the merchant, virtual outlet, and customer each having a computer connected through the Internet; the method comprising:

receiving at the virtual outlet computer from the customer computer a request for a virtual outlet Web page, the virtual outlet Web page having an indication of the product and a link associated with the product, the link identifying a merchant Web page of the merchant computer, identifying the virtual outlet, and identifying a virtual outlet return Web page;

sending from the virtual outlet computer to the customer computer the virtual outlet Web page;

displaying at the customer computer the virtual outlet Web page;

receiving from the customer at the customer computer a selection of the product;

sending from the customer computer to the merchant computer a request for the merchant Web page identified by the link associated with the selected product, the request including an indication of the virtual outlet;

receiving at the merchant computer the request for the merchant Web page;

upon receiving the request for the merchant Web page,

under control of the merchant computer, modifying the merchant Web page to contain a return link based on the indication of the virtual outlet included in the request so that upon completion of the purchase, the customer computer displays the virtual outlet return Web page identified by the return link; and

sending from the merchant computer to the customer computer the modified merchant Web page;

displaying at the customer computer the modified merchant Web page, wherein after the customer purchases the product from the merchant, the merchant credits the virtual outlet identified by the link; and

upon completion of the purchase, displaying at the customer computer the virtual outlet return Web page identified by the return link in the modified merchant Web page.

6,016,505

PROGRAM PRODUCT TO EFFECT BARRIER SYNCHRONIZATION IN A DISTRIBUTED COMPUTING ENVIRONMENT

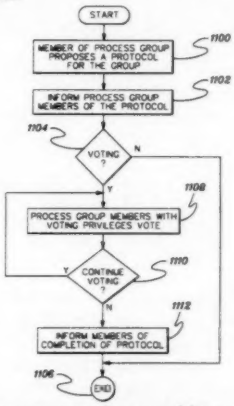
Peter Richard Badovinatz, Kingston, N.Y.; Larry Bert Brenner, Austin, Tex.; Tushar Deepak Chandra, Elmsford, N.Y.; Ajei Sarat Gopal, Fort Lee, N.J.; Orvalle Theodore Kirby, Pleasant Valley, N.Y.; John Arthur Pershing, Jr., Buchanan, N.Y.; Marion Lee Blount, Mahopac, N.Y.; Marc Adam Kaplan, Katonah, N.Y., and John Joseph Edward Turek, South Nyack, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 08/641,385, Apr. 30, 1996, abandoned. This application Nov. 24, 1997, Appl. No. 976,934.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *13/00*

U.S. Cl. 709—205 **14 Claims**



14. A computer program product comprising a computer useable medium having computer readable program code means therein for use in barrier synchronization in a distributed computing environment having a group of members, each member having a related process executing on one or more processors, said computer readable program code means in said computer program product comprising:

computer readable program code means for causing a computer to affect initiating a protocol having a dynamic number of synchronization phases, each phase including a round of voting by each member of the group, said round of voting comprising:

(a) indicating a desire to accept and complete the present protocol;

(b) continue indicating a desire to proceed to said another synchronization phase; or

(c) indicating a desire to reject and end the present protocol; and

computer readable program code means for causing a computer to affect processing said protocol.

6,016,506

NON-INTRUSIVE SCSI STATUS SENSING SYSTEM

Stephen J. Amuro, Middletown, and Paul J. Giorgio, Providence, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy

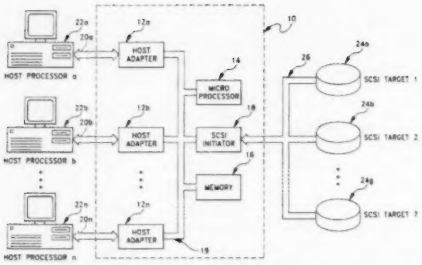
Filed Mar. 29, 1994, Appl. No. 219,553

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *13/38;15/17*

U.S. Cl. 709—217 **7 Claims**

1. A non-intrusive SCSI status sensing system comprising:



a controller having operating means for initiating and transmitting non-intrusive status requests and for receiving and storing ATTENTION DATA and PM DATA responses to said non-intrusive status requests; and

a plurality of SCSI targets with each of said SCSI targets connected to said controller for receiving said non-intrusive status requests from said controller and having generating and transmitting means for generating and transmitting said ATTENTION DATA and PM DATA responses to said controller on receiving said non-intrusive status requests.

6,016,507

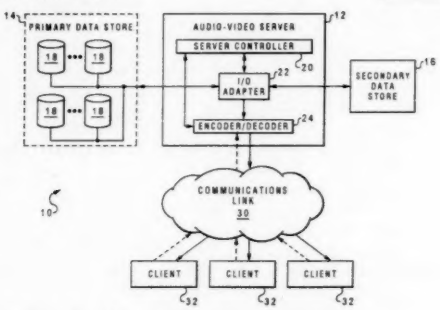
METHOD AND APPARATUS FOR DELETING A PORTION OF A VIDEO OR AUDIO FILE FROM DATA STORAGE PRIOR TO COMPLETION OF BROADCAST OR PRESENTATION

David John Carroll, and Wade David Shaw, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1997, Appl. No. 976,019

Int. Cl.[7] H04N *7/10*

U.S. Cl. 709—217 **27 Claims**



1. An audio-video broadcast apparatus, comprising:

non-volatile data storage that stores a file that contains at least one of audio data and video data, wherein all of said file is concurrently stored within said non-volatile data storage prior to broadcast of contents of said file; and

an audio-video server coupled to said non-volatile data storage, said audio-video server including:

means for broadcasting contents of said file; and

means for causing said non-volatile storage to delete a portion of said file that has been broadcast from said non-volatile storage prior to said audio-video server broadcasting all of said contents of said file.

6,016,508

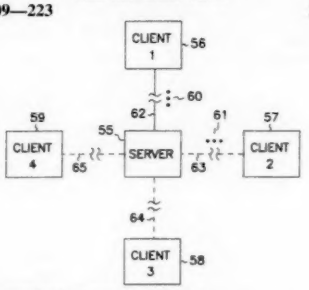
SERVER-DETERMINED CLIENT REFRESH PERIODS FOR DYNAMIC DIRECTORY SERVICES

Lon-Chan Chu, Bellevue; Yoram Yaacovi, Redmond, and Kent F. Settle, Kirkland, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jul. 2, 1997, Appl. No. 886,796

Int. Cl.[7] G06F *13/00*

U.S. Cl. 709—223 **20 Claims**



1. A computerized system comprising:

a plurality of clients, each having a client refresh period (CRP); and,

a server, communicatively coupled to each client, and maintaining a dynamic directory of only the clients messaging the server at least once during every CRP,

wherein the server at least periodically changes the CRP for at least one of the clients so that the server is able to timely respond to messages received from the clients.

6,016,509

GENERAL PURPOSE METERING MECHANISM FOR DISTRIBUTION OF ELECTRONIC INFORMATION

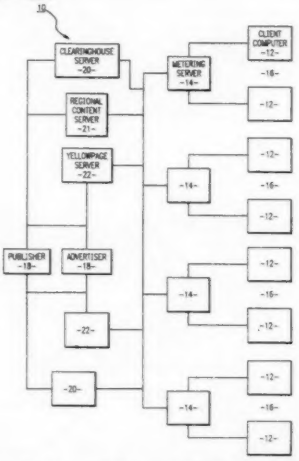
Rick Dedrick, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of application No. 08/597,466, Feb. 2, 1996, Pat. No. 5,768,521, which is a continuation of application No. 08/243,845, May 16, 1994, abandoned. This application Jan. 9, 1998, Appl. No. 4,832.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *13/00;153/00*

U.S. Cl. 709—224 **20 Claims**



1. A server that is coupled to an external device that contains a unit of information having a content data and a content title, and to one or more client computers each being operated by an end user

and each to receive the content title and can request access to the content data, comprising:

a metering server to receive said unit of information from said external device, transfer said content title to said plurality of client computers of end users, and transfer said content data to a client computer of an end user that requests said content data.

6,016,510

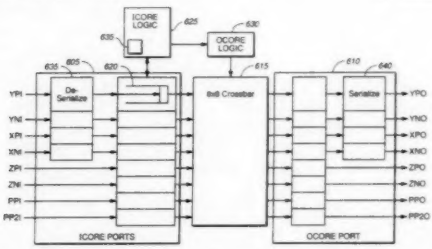
TORUS ROUTING ELEMENT ERROR HANDLING AND SELF-CLEARING WITH PROGRAMMABLE WATERMARKING

Marc Alan Quattromani, Beaverton, and Mark S. Myers, Portland, both of Oreg., assignors to Siemens Pyramid Information Systems, Inc., San Jose, Calif.

Filed Jun. 24, 1998, Appl. No. 103,559

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 709—233 **30 Claims**



1. A method for controlling the transmission of message packet data along a connection between a first routing element and a second routing element comprising the steps of:

transmitting data along the connection from the first routing element to a buffer in the second routing element;

determining a first pre-programmed quantity based on a period of time required to transmit data along the connection between the first and the second routing elements;

comparing the quantity of data in the buffer to the first pre-programmed quantity; and

blocking the first routing element from transmitting additional data to the buffer in the second routing element as a function of the comparison between the quantity of data in the buffer and the first pre-programmed quantity.

6,016,511

APPARATUS AND METHOD FOR INTERFACING PROTOCOL APPLICATION DATA FRAME OPERATION REQUESTS WITH A DATA FRAME INPUT/OUTPUT DEVICE

Steven R. Cook, Franklin, Mass., assignor to Motorola Inc., Schaumburg, Ill.

Filed Sep. 12, 1997, Appl. No. 938,947

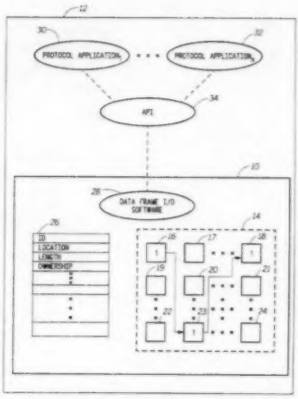
Int. Cl.[7] **G06F** *13/38;15/17*

U.S. Cl. 709—236 **43 Claims**

1. A method of interfacing protocol application data frame operation requests with a data frame input/output device having a buffer structure containing data frames according to a buffer structure scheme, while maintaining isolation between the buffer structure and the protocol applications, the method comprising:

receiving, with an interface, from a protocol application a data frame operation request for operation on a portion of an identified data frame within the buffer structure;

linking, with the interface, the request to an appropriate data frame operation routine in the data frame input/output device; and



the data frame operation routine executing the request, in conjunction with the protocol application, on the portion of the identified data frame without requiring that the protocol application have knowledge of the buffer structure scheme.

6,016,512

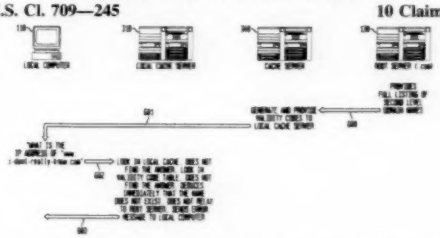
ENHANCED DOMAIN NAME SERVICE USING A MOST FREQUENTLY USED DOMAIN NAMES TABLE AND A VALIDITY CODE TABLE

Christian Huitema, New York, N.Y., assignor to Telcordia Technologies, Inc., Morristown, N.J.

Provisional application No. 60/066,227, Nov. 20, 1997. This application Aug. 18, 1998, Appl. No. 135,619.

Int. Cl.[7] **G06F** *13/00;17/30;* **H04L** *12/26*

U.S. Cl. 709—245 **10 Claims**



1. A method for reducing the number of erroneous domain requests forwarded to domain name server (DNS) root servers from a local computer, the local computer being connected to a local cache server storing a most frequently used domain names table with associated domain addresses and a validity code table and being connected to one or more remote root servers, the method comprising the steps of

receiving a user request for a domain name,

in response to said request, accessing the most frequently used domain names table in the local cache server,

if the domain name is not in the most frequently used domain names table, generating a code check to access the validity code table in the local cache server,

if the generated code check is not in the validity code table, returning an error message to the local computer, and

if the generated code check is in the validity code table, forwarding the request to one of said remote root servers.

6,016,513

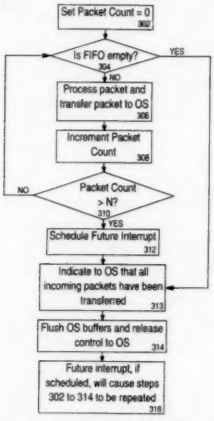
METHOD OF PREVENTING PACKET LOSS DURING TRANSFERS OF DATA PACKETS BETWEEN A NETWORK INTERFACE CARD AND AN OPERATING SYSTEM OF A COMPUTER

Glen H. Lowe, Union City, Calif., assignor to 3Com Corporation, Santa Clara, Calif.

Filed Feb. 19, 1998, Appl. No. 25,960

Int. Cl.[7] G06F *13/00*

U.S. Cl. 709—250 **26 Claims**



1. In a computer system, a method of preventing packet loss during transfer of a plurality of data packets between a network interface card and a host operating system of the computer system, the method comprising the steps of:

a) transferring a burst of the data packets from the network interface card to a buffer controlled by the operating system, wherein the burst includes at most a maximum number of data packets the buffer is capable of receiving without packet loss; and

b) sending a signal to the operating system, the signal falsely indicating to the operating system that all of the plurality of the data packets have been transferred, wherein the signal causes the operating system to flush the buffer such that a next burst of the data packets can be received without packet loss.

6,016,514

METHOD AND APPARATUS FOR AN IMPROVED SPECIALIZATION OF A CORBASERVICES GENERICFACTORY

Kimberly Ann Cink, Rochester, Minn., and Russell Ley Newcombe, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1996, Appl. No. 741,730

Int. Cl.[7] G06F *9/46*

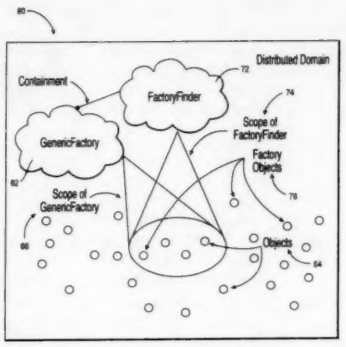
U.S. Cl. 709—300 **9 Claims**

1. A method, implemented in a computer system, for defining a scope for a plurality of objects in a distributed domain in an object oriented environment, comprising the steps of:

providing a factory object for creating said plurality of objects in said distributed domain in said object oriented environment;

providing a finder object for retrieving type specific factories capable of creating said plurality of objects within a particular scope in said distributed domain in said object oriented environment; and

defining a scope for said factory object by the particular scope of said finder object by containing said finder object in said



factory object such that an operation to create an object is executed for said factory object.

6,016,515

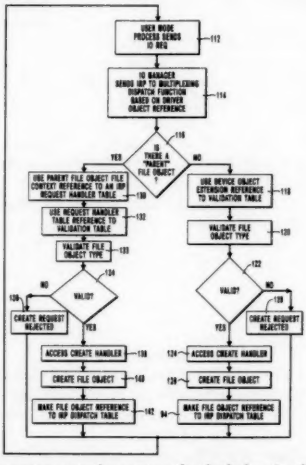
METHOD, COMPUTER PROGRAM PRODUCT, AND DATA STRUCTURE FOR VALIDATING CREATION OF AND ROUTING MESSAGES TO FILE OBJECT

George H. J. Shaw, Woodinville, and Bryan A. Woodruff, New Bend, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Apr. 4, 1997, Appl. No. 826,644

Int. Cl.[7] G06F *13/10*

U.S. Cl. 709—301 **28 Claims**



1. In a computer operating system that includes a) a driver object for managing a software driver as a system resource, b) one or more device objects each of which define a software driver's functionality and availability to other operating system resources and each of which includes a private data area containing a validation table with valid file object types and associated create handlers for each file object type, and c) one or more file objects for managing invocation of an operating system resource as specified by a particular device object and each of which includes a private data area containing an IRP request handler table and a validation table with valid file object types and associated create handlers for each file object type, and wherein the file objects are hierarchically related to parent objects that may consist of either device objects or other file objects, a method of standardizing i) validation of creation of, or ii) routing of messages, to file objects

in order to eliminate the need for third party driver developers to write validation or routing code for such drivers, the method comprising steps for:

receiving at a driver object a request to either create a particular type of file object or to route a message to a particular type of file object;

sending the received request to a multiplexing dispatch function which is resident as part of the operating system, as opposed to being provided by a third party driver developer;

the multiplexing dispatch function then accessing a private data area of a parent object for the purpose of searching for said particular type of file object for which the creation or routing request was sent; and

if said particular type of file object is found, accessing the appropriate create handler for said particular type of file object, and if not, returning an error message and rejecting the request.

6,016,516

REMOTE PROCEDURE PROCESSING DEVICE USED BY AT LEAST TWO LINKED COMPUTER SYSTEMS

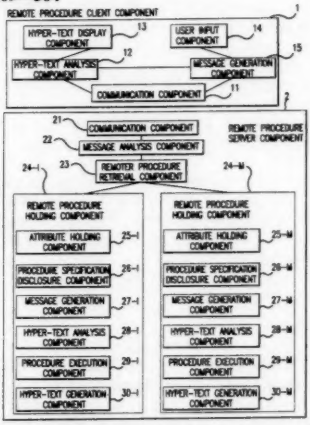
Kazunori Horikiri, Nakai-machi, Japan, assignor to Fuji Xerox Co. Ltd., Tokyo, Japan

Filed Jul. 30, 1997, Appl. No. 902,235

Claims priority, application Japan, Aug. 7, 1996, 8-208014; Aug. 7, 1996, 8-208015

Int. Cl.[7] **G06F** *15/163*

U.S. Cl. 709—304 **21 Claims**



1. A remote procedure processing device for processing remote procedures, the remote procedures performed by at least two linked computer systems, comprising:

communication means for receiving remote procedure execution requests and transmitting execution results;

means for holding said remote procedures and executing said remote procedures in response to said execution requests;

means for analyzing said execution requests received by said communication means and extracting a retrieval expression and a parameter to be used in the execution of said requested procedures; and

means for retrieving said remote procedures from said remote procedure holding means corresponding to said retrieval expression extracted by said analyzing means and sending said parameter to a first remote procedure holding means;

wherein said first remote procedure holding means executes a first procedure using said parameter received from said remote procedure retrieving means; and

a message containing a retrieval expression and a parameter for another remote procedure holding means is generated during execution of said first procedure by said remote procedure holding means, said message being transmitted to said remote procedure retrieving means, said remote procedure retrieving means sending a reply to said message, said reply to said message being received by said first remote procedure holding means, and said execution of said first procedure being continued.

6,016,517

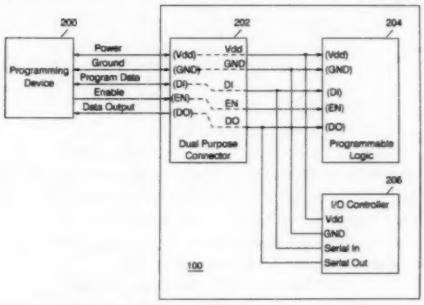
DATA PROCESSING SYSTEM AND METHOD FOR OPTIMIZING CONNECTOR USAGE

Louis Bennie Capps, Jr., Round Rock; Robert Christopher Dixon, Austin; Josefina Santiago Drerup, Austin, and Thoi Nguyen, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1997, Appl. No. 827,743

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 710—1 **20 Claims**



1. A printed circuit board, comprising:

a first device for performing a first function during a first mode of operation;

a second device for performing a second function during a second mode of operation; and

a connector coupled to the first device to provide a first plurality of information values during the first mode of operation and the connector coupled to the second device to provide a second plurality of information values during the second mode of operation.

6,016,518

AUTOMATIC MASTER/SLAVE DESIGNATION FOR COMPUTER PERIPHERALS

Shinji Matsushima, Kawasaki, and Mitsuhiro Yamazaki, Sagamihara, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

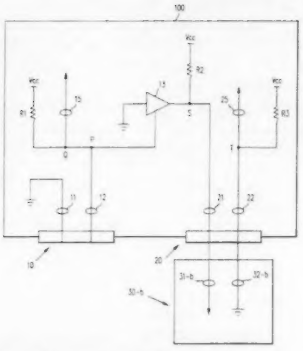
Filed Dec. 3, 1996, Appl. No. 753,854

Claims priority, application Japan, Mar. 22, 1996, 8-3015959

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 710—8 **9 Claims**

1. An information processing apparatus comprising:



first and second connectors; and

master/slave designation means, coupled to the first and the second connectors, for providing a control signal to designate a first peripheral device as master, wherein the master/slave designation means designates the first peripheral device as master when the first peripheral device is connected to the second connector and no peripheral device is connected to the first connector.

6,016,519

DATA COMMUNICATION SYSTEM, DATA COMMUNICATION DEVICE AND MEMORY MEDIUM, FOR STORING DATA COMMUNICATION PROGRAM

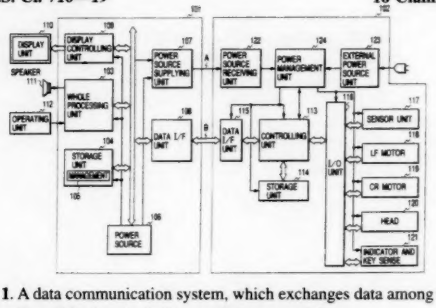
Makoto Chida, Kunitachi; Kazuo Iwata, and Akiyoshi Shimoda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1997, Appl. No. 980,206

Claims priority, application Japan, Nov. 29, 1996, 8-320061

Int. Cl.[7] G06F *13/14*

U.S. Cl. 710—19 **16 Claims**



1. A data communication system, which exchanges data among a plurality of devices includinq a printer, comprising:

power supply means for supplying power from a first device to said printer;

detection means for detecting a plurality of states of said printer by employing power supplied by said power supply means;

transmission means for transmitting status information detected by said detection means to said first device;

storage means for storing said status information for said printer, which is received by said first device; and

output means for outputting said status information for said printer that is stored in said storage means.

6,016,520

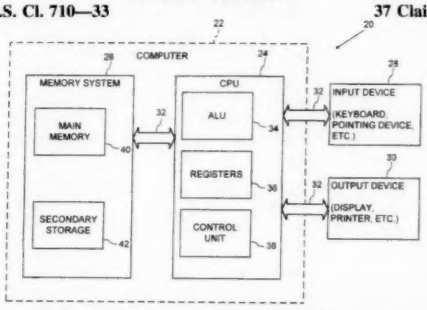
METHOD OF VIEWING AT A CLIENT VIEWING STATION A MULTIPLE MEDIA TITLE STORED AT A SERVER AND CONTAINING A PLURALITY OF TOPICS UTILIZING ANTICIPATORY CACHING

Jean-Remy Facq, Bellevue, and Lindsay A. Harris, Bothell, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jul. 14, 1995, Appl. No. 502,727

Int. Cl.[7] G06F *13/14*

U.S. Cl. 710—33 **37 Claims**



1. In a distributed computer network comprising a remote multiple media content server and a client viewing station in communication via a wide-area connection, a method of viewing at the client viewing station a multiple media title stored at said server and containing a plurality of topics associated with multiple media items, the method comprising the steps of:

receiving at said server a first request by the client viewing station for data relating to a selected one of the topics contained in the multiple media title;

determining from multiple media items associated with the selected topic and responsive to the first request which of the multiple media items of the topic are likely to be requested next by the client viewing station;

transferring from said server to the client viewing station of said multiple media items determined as likely to be requested next; and

caching said transferred multiple media items in a cache storage at the client viewing station whereby said multiple media items are available without requesting from said server when rendering a presentation of at least a portion of the topic at the client viewing station.

6,016,521

COMMUNICATION CONTROL DEVICE

Kimikatsu Matsubara, Hyogo, Japan, assignor to Mitsubishi Electric Semiconductor Systems Corporation, and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 8, 1998, Appl. No. 56,648

Claims priority, application Japan, Dec. 1, 1997, 9-330624

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—34 **20 Claims**

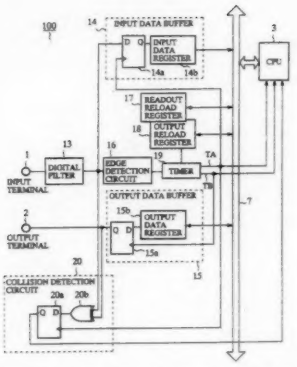
1. A communication control device comprising:

an input terminal connected to communication channels for inputting communication data on said communication channels;

an output terminal connected to said communication channels through a wired OR logic or a wired AND logic and for outputting communication data to said communication channels;

a central processing unit for receiving said communication data from said input terminal and for generating said communication data to be transferred to said output terminal;

an output buffer for storing said communication data written by the central processing unit and for outputting said communication data to said communication channels through said output buffer;



an input buffer for storing said communication data on said communication channels through said input terminal and said communication data stored by said input buffer being read by said central processing unit;

a readout reload register to which a readout count value is set by said central processing unit;

an output reload register to which an output count value is set by said central processing unit; and

a timer for reading said count values stored in both said readout reload register and said output reload register alternately every an occurrence of a time out, and for counting each of said readout count value and said output count value,

wherein when said time out is happen based on said readout count values, said input data buffer stores said communication data, and when said time out is happen based on said output count values, said output data buffer outputs said communication data.

6,016,522

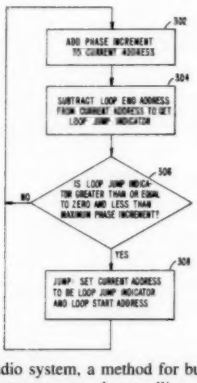
SYSTEM FOR SWITCHING BETWEEN BUFFERS WHEN RECEIVING BURSTY AUDIO BY COMPUTING LOOP JUMP INDICATOR PLUS LOOP START ADDRESS FOR READ OPERATIONS IN SELECTED BUFFER

David P. Rossum, Monterey, Calif., assignor to Creative Labs, Inc., Milpitas, Calif.

Filed Nov. 13, 1997, Appl. No. 969,684

Int. Cl.[7] **G06F** *13/00;13/28*

U.S. Cl. 710—52 **14 Claims**


302
ADD PHASE INCREMENT TO CURRENT ADDRESS
304
SUBTRACT LOOP END ADDRESS FROM CURRENT ADDRESS TO GET LOOP JUMP INDICATOR
306
IS LOOP JUMP INDICATOR GREATER THAN OR EQUAL TO ZERO AND LESS THAN MAXIMUM PHASE INCREMENT?
NO
YES
308
JUMP: SET CURRENT ADDRESS TO BE LOOP JUMP INDICATOR AND LOOP START ADDRESS

1. In a digital audio system, a method for buffering audio data received from a bursty source and controlling read access to said audio data, said method comprising steps of:

a) providing a first buffer and a second buffer, each of said buffers comprising a plurality of sequential memory locations in an address space common to both buffers, wherein audio data received from said source fills a selected one of said first and said second buffers, the other buffer being available for read access;

b) adding a phase increment to a current playback address; thereafter

c) subtracting a loop end address from said current playback address to obtain a loop jump indicator; and thereafter

d) if said loop jump indicator is greater than or equal to zero and less than a minimum spacing between said first and second buffers, setting said current address to be said loop jump indicator plus a loop start address to cause read operations to continue in said selected one buffer.

6,016,523

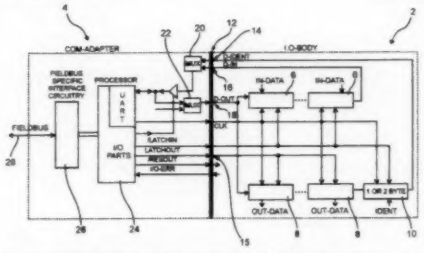
I/O MODULAR TERMINAL HAVING A PLURALITY OF DATA REGISTERS AND AN IDENTIFICATION REGISTER AND PROVIDING FOR INTERFACING BETWEEN FIELD DEVICES AND A FIELD MASTER

Achim Zimmerman, Dietzenbach; Heinz Schaffner, Rödermark; Edgar Polly, Seligenstadt, and Helmut Zimmermann, Hammersbach, all of Germany, assignors to Schneider Automation, Inc., North Andover, Mass.

Filed Mar. 9, 1998, Appl. No. 36,565

Int. Cl.[7] **G06F** *13/00;3/00*

U.S. Cl. 710—63 **23 Claims**



1. An input/output (IO) body for interfacing between field devices and a field master, the body comprising:

a plurality of in-data registers for accepting data from the field devices;

a plurality of out-data registers for sending data to field devices;

an identification register for identifying the data in relation to the field devices; and

an interface portion having an identification port communicating with the identification register, an in-data port communicating with the in-data registers, and an out-data port communicating with the out-data registers, the body being adapted to directly attach to and communicate with a plurality of different types of communications adapters through the interface portion for communication with a field master, the body also being adapted to directly attach to and communicate with a PLC type of field master through the interface portion.

6,016,524

COLLATING BITS FROM A BYTE SOURCE

James Kleck, Santa Cruz, Calif., assignor to 8×8, Inc., Santa Clara, Calif.

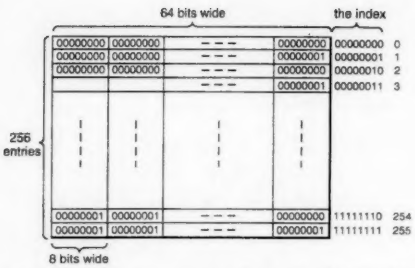
Continuation of application No. 08/656,676, May 31, 1996, Pat. No. 5,898,898. This application Apr. 24, 1998, Appl. No. 66,248.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 710—65 **25 Claims**

1. A method for collating a bit-group having a plurality of bits, comprising:



generating a bit-pattern corresponding to the plurality of bits in the bit-group, the bit pattern including bit-segments equal in number to the plurality of bits in the bit-group, each of the bit-segments having a first number of bit positions, and one bit position in each of the bit-segments occupied by a corresponding bit in the bit-group, all other positions in each of the bit-segments occupied by a selected bit value; and

combining the bit-pattern with contents of an accumulation register, placing a result thereof in the accumulation register.

6,016,525

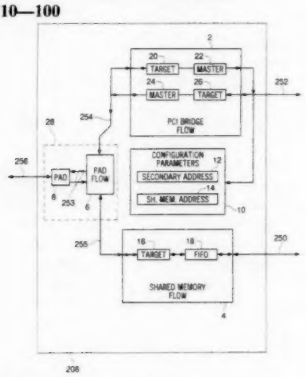
INTER-BUS BRIDGE CIRCUIT WITH INTEGRATED LOOPBACK CAPABILITY AND METHOD FOR USE OF SAME

Brian E. Corrigan, and Alan D. Rymph, both of Wichita, Kans., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Mar. 17, 1997, Appl. No. 819,018

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 710—100 **18 Claims**



1. A bus bridge circuit comprising:

a primary interface connecting said bus bridge to a primary I/O bus;

a secondary interface connecting said bus bridge to a secondary I/O bus and adapted for bi-directional exchange of data elements with said primary interface;

a shared memory interface connecting said bus bridge to a shared memory bus external to said bus bridge circuit and adapted for bi-directional exchange of data elements with said secondary interface; and

configuration control circuits for directing loopback data transfers between said primary interface and said shared memory interface via said secondary interface.

6,016,526

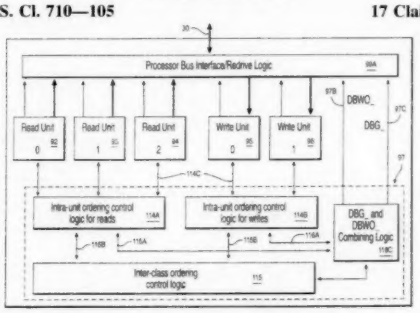
METHOD AND APPARATUS FOR TRANSFERRING DATA BETWEEN BUSES HAVING DIFFERING ORDERING POLICIES VIA THE USE OF AUTONOMOUS UNITS

Ravi Kumar Arimilli, and Derek Edward Williams, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1997, Appl. No. 934,415

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 710—105 **17 Claims**



1. An apparatus for ordering operations and data received by a first bus having a first ordering policy in accordance with a second ordering policy which is different from the first ordering policy, and for transferring the ordered data on a second bus having the second ordering policy, the apparatus comprising:

a plurality of execution units for storing operations and executing the transfer of data between the first and second buses, each one of the execution units being assigned to a group which represents a class of operations wherein at least one first unit for a first class of operation is assigned to a single first class operation at a time and at least one second unit for a second class of operation is assigned to a single second class operation at a time;

intra prioritizing means, for each group, for prioritizing the stored operations in accordance with the second ordering policy exclusive of the operations stored in the other groups; and

inter prioritizing means for determining which one of the prioritized operations can proceed to execution in accordance with the second ordering policy.

6,016,527

METHOD AND APPARATUS FOR IMPROVING FAIRNESS IN SCSI BUS ARBITRATION

Robert A. DeMoss, Wichita, Kans., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 30, 1996, Appl. No. 724,596

Int. Cl.[7] **G06F** *13/14*

U.S. Cl. 710—117 **26 Claims**

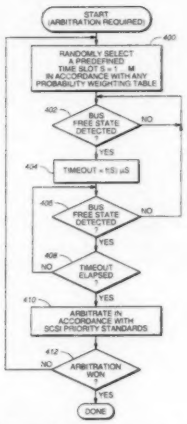
3. In a system including a SCSI bus and at least one device attached thereto requiring control of said bus, a method for implementing bus arbitration comprising the steps of:

a) pseudo-randomly selecting one time slot of a plurality of time slots wherein each of said plurality of time slots is associated with a delay period before arbitration begins;

b) awaiting a BUS FREE state on said bus;

c) delaying arbitration by said device until expiration of the delay period associated with the selected time slot;

d) arbitrating for said bus on behalf of said device; and



repeating steps a) through d) in response to a failure to obtain said bus in the arbitrating step d).

6,016,528

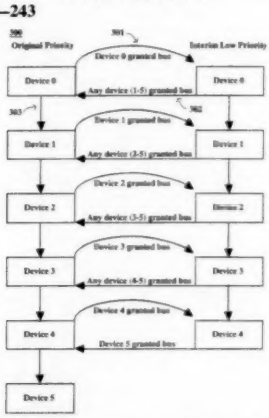
PRIORITY ARBITRATION SYSTEM PROVIDING LOW LATENCY AND GUARANTEED ACCESS FOR DEVICES

Ken Jaramillo, and David Gerard Spaniol, both of Phoenix, Ariz., assignors to VISI Technology, Inc., San Jose, Calif.

Filed Oct. 29, 1997, Appl. No. 960,184

Int. Cl.[7] **G06F** *13/14*

U.S. Cl. 710—243 **18 Claims**



1. A priority arbitration system for interfacing a plurality of peripheral component interconnect (PCI) agents coupled to a PCI bus such that high priority PCI agents are satisfied without starving low priority PCI agents, comprising:

a PCI bus adapted to transmit data signals thereon;

a high priority PCI agent coupled to said PCI bus;

a low priority PCI agent coupled to said PCI bus;

an arbiter coupled to said high priority PCI agent and said low priority PCI agent via said PCI bus;

said arbiter granting ownership of said PCI bus to said high priority PCI agent, said high priority PCI agent becoming an interim low priority PCI agent after a grant to said high priority PCI agent, said low priority PCI agent having a higher priority than said interim low priority PCI agent, said interim low priority PCI agent reverting to said high priority PCI agent subsequent to a grant to said low priority PCI agent, said arbiter granting ownership of said PCI bus to said low priority PCI agent before granting ownership of said PCI bus to said interim low priority PCI agent such that said low priority PCI agent is not prevented from accessing said PCI bus by said high priority PCI agent, and wherein said high priority PCI agent becomes said interim low priority PCI agent, said interim low priority PCI agent being the lowest priority of a plurality of PCI agents requesting ownership of said PCI bus.

6,016,529

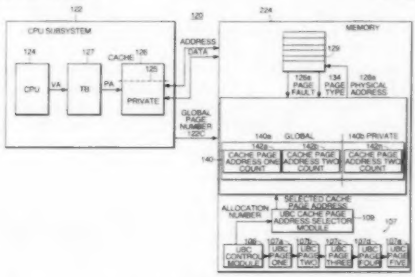
MEMORY ALLOCATION TECHNIQUE FOR MAINTAINING AN EVEN DISTRIBUTION OF CACHE PAGE ADDRESSES WITHIN A DATA STRUCTURE

Larry William Woodman, Nottingham, N.H., assignor to Digital Equipment Corporation, Houston, Tex.

Filed Nov. 26, 1997, Appl. No. 978,940

Int. Cl.[7] **G06F** *17/30*

U.S. Cl. 711—3 **16 Claims**



1. A method of storing pages of a data file in a memory of a computer system, the memory apportioned into a plurality of pages with each of the physical addresses of the memory substantially including a cache page address portion, the method comprising the steps of:

allocating a page of memory from an array of free pages in the memory for storing a page of data from the data file, where the page of memory allocated is selected dependent on the cache page address portion of the physical address of the page of memory in order to maintain a substantially even distribution of cache page addresses within a plurality of physical addresses of pages of memory storing copies of pages of data from the data file; and

writing the page of the data file to the allocated page of physical memory.

6,016,530

MASS COMPUTER STORAGE SYSTEM HAVING BOTH SOLID STATE AND ROTATING DISK TYPES OF MEMORY

Daniel L. Auclair, Mountain View, and Eliyahou Harari, Los Gatos, both of Calif., assignors to SanDisk Corporation, Sunnyvale, Calif.

Continuation of application No. 08/287,107, Aug. 8, 1994, Pat. No. 5,778,418, which is a continuation of application No. 07/767,106, Sep. 27, 1991, abandoned. This application Apr. 21, 1998, Appl. No. 63,748.

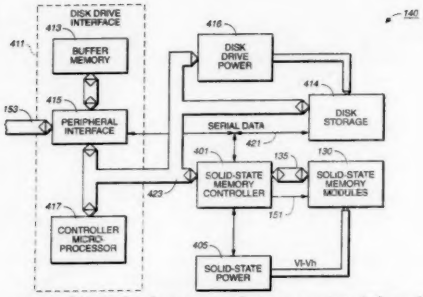
This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06F** *12/06;12/10*

U.S. Cl. 711—6 **18 Claims**

1. A method of configuring and operating a mass storage system as part of a computer system that also includes a central processor connected to communicate with the mass storage system over a common system bus, wherein the central processor is programmed to address data within individual sectors in an entire memory space of the mass storage system over said bus with a given disk drive format, comprising the steps of:

providing as the mass storage system both a rotating disk drive memory and a solid-state flash electrically erasable and pro-



grammable read only memory that are connected through a controller to the common system bus to receive addresses from the central processor,

partitioning each of the disk drive and solid-state memory into individually addressable sectors that each store a given amount of data,

designating within the controller first and second non-overlapping portions of the mass memory address space, the first portion being implemented by the disk drive memory and the second portion being implemented by the solid state memory,

causing the controller to access a data sector within the disk drive when an address received in said given disk drive format from the central processor over the system bus is within said first address space portion, and

causing the controller to access a data sector within the solid state memory when an address received in said given disk drive format from the central processor over the system bus is within said second address space portion, including a step of translating the address from the central processor within the second address space portion into a physical address of a data sector of the solid state memory, the solid state memory being operated with individual memory cells thereof being programmable into more than two detectable states in order to store more than one bit of data per cell.

6,016,531

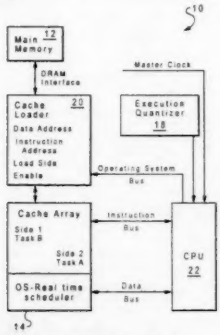
APPARATUS FOR PERFORMING REAL TIME CACHING UTILIZING AN EXECUTION QUANTIZATION TIMER AND AN INTERRUPT CONTROLLER

Scott W. Rixner, Cambridge, Mass., and Clarence R. Ogilvie, Huntington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1995, Appl. No. 451,802

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 711—118 **9 Claims**



1. A data processing system comprising:

a central processing unit;

a multi-port cache array coupled to said central processing unit;

a cache loader, coupled to said multi-port cache array;

a main memory unit, comparatively slow to said cache array, coupled to said cache loader;

a plurality of asynchronous clock interrupts, coupled to said central processing unit;

an interrupt controller, coupled to said central processing unit, for managing real time data streams into said cache array;

an execution quantizer coupled to said interrupt controller, wherein said execution quantizer limits any interrupts on said central processing unit from said plurality of asynchronous clock interrupts from executing after a fixed execution quantization (EQ) time; and

gating logic, coupled to said execution quantizer, for gating off any interrupts received during a cache load or cache unload operation of a quantized block so as to allow said interrupts to be processed after completion of said cache load or unload operation.

6,016,532

METHOD FOR HANDLING DATA CACHE MISSES USING HELP INSTRUCTIONS

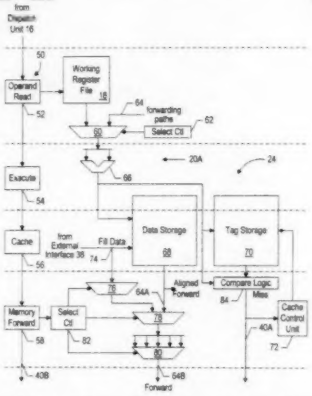
William L. Lynch, La Honda, and Gary R. Lauterbach, Los Altos, both of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jun. 27, 1997, Appl. No. 884,066

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06F** *17/30*

U.S. Cl. 711—118 **26 Claims**



1. A method for handling a data cache miss in a microprocessor, comprising:

generating at least one help instruction in a help instruction generator within said microprocessor, wherein said help instruction is configured to control a data cache within said microprocessor during a clock cycle in which a cache line corresponding to said data cache miss is conveyed to said data cache; and

conveying said help instruction to said data cache during said clock cycle.

6,016,533

WAY PREDICTION LOGIC FOR CACHE ARRAY

Thang M. Tran, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 16, 1997, Appl. No. 991,846

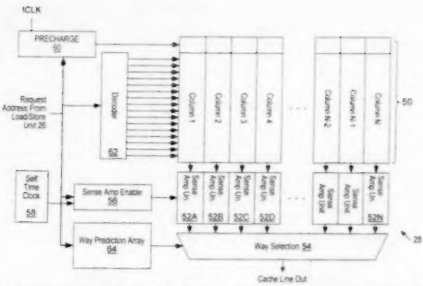
Int. Cl.[7] **G06F** *12/00;13/00*

U.S. Cl. 711—128 **17 Claims**

1. A cache array comprising:

a plurality of memory locations;

a plurality of storage locations, wherein each storage location is configured to store a way prediction, wherein a first portion of a requested address selects a set of way predictions;



a decoder coupled to said plurality of memory locations and said plurality of storage locations, wherein said decoder is configured to receive and decode a second portion of said requested address, wherein said decoder is configured to select a first subset of said plurality of memory locations based upon said second portion of said requested address and said set of way predictions;

a plurality of pass transistors coupled to said plurality of memory locations, wherein said plurality of pass transistors are configured to receive a third portion of said requested address, wherein said plurality of pass transistors are configured to select a second subset of said plurality of memory locations based upon said third portion of said requested address;

a sense amp unit coupled to said plurality of pass transistors, wherein said sense amp unit is configured to read the contents of any memory locations that are located within an intersection of said first subset and said second subset; and

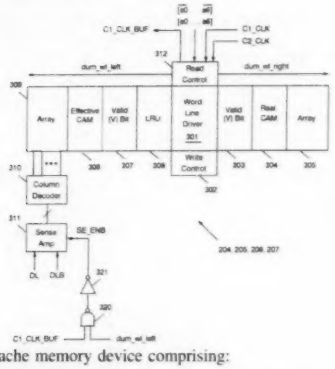
a column select decoder coupled to said plurality of pass transistors and configured received and decode said third portion of said requested address, wherein said column select decoder is configured to enable a set of pass transistor within said plurality of pass transistors based upon said decoded third portion of said requested address.

6,016,534

DATA PROCESSING SYSTEM FOR CONTROLLING OPERATION OF A SENSE AMPLIFIER IN A CACHE

Manoj Kumar, and Huy Van Pham, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1997, Appl. No. 887,825
Int. Cl.[7] G06F *13/00;* **G11C** *11/413*
U.S. Cl. 711—154 **6 Claims**



1. A cache memory device comprising:

a memory array,

an effective content address memory (ECAM);

a column decoder for accessing the memory array;

a sense amplifier coupled to the column decoder;

first logic circuitry for asserting an output signal when all address bits of a read request have been received during an evaluation phase of the cache memory device;

circuitry for comparing an address of the read request with entries in the ECAM, wherein a hit results when the address of the read request matches an entry in the ECAM, wherein the hit results in a an ECAM hit signal;

second logic circuitry for producing a dummy word line signal in response to the output signal;

third logic circuitry for asserting a sense enable signal in response to the ECAM hit signal and the dummy word line signal; and

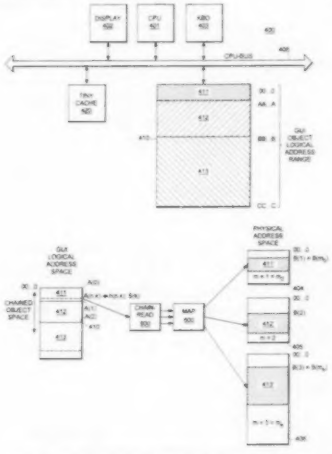
circuitry for enabling the sense amplifier in response to receipt of the sense enable signal.

6,016,535

METHOD FOR DYNAMICALLY AND EFFICIENTLY CACHING OBJECTS BY SUBDIVIDING CACHE MEMORY BLOCKS INTO EQUALLY-SIZED SUB-BLOCKS

Jeffrey Isaac Krantz, Boca Raton; Marc Alan Bloomfield, Lighthouse Point, and Thanh Luu, Sunrise, all of Fla., assignors to Citrix Systems, Inc., Fort Lauderdale, Fla.

Filed Oct. 11, 1995, Appl. No. 541,128
Int. Cl.[7] G06F *12/02*
U.S. Cl. 711—171 **23 Claims**



1. In a logical cache memory including a plurality of maximal-size pages beginning at a logical cache base memory address, each maximal-size logical cache memory page configured to store data objects of a given size, a method for dynamically reconfiguring one of the logical cache memory pages to store data objects having a size different from the size of the data object previously stored by that cache page, the method comprising the steps of:

(a) receiving a data object to be cached having a size smaller than the maximal size;

(b) determining whether one of a plurality of logical cache memory pages is already configured to store data objects having the smaller size of the received data object;

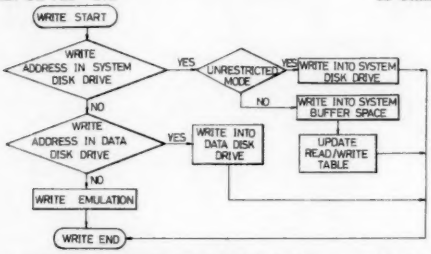
(c) selecting, when no logical cache memory page is already configured to store data objects having the smaller size of the received data object, one of the maximal logical cache memory pages; and

(d) reconfiguring the selected cache page into more than two equally-sized blocks for storing data objects having the smaller size of the received data object.

6,016,536
METHOD FOR BACKING UP THE SYSTEM FILES IN A HARD DISK DRIVE

Ye-Te Wu, Chia-I, and Chia-Jui Tseng, Chia-I Hsien, both of Taiwan, assignors to Ye-Te Wu, Taiwan

Filed Nov. 13, 1997, Appl. No. 970,119
Int. Cl.[7] G06F *11/00*
U.S. Cl. 711—173 **11 Claims**



1. A memory management method for a computer with a hard disk drive, comprising the steps of:

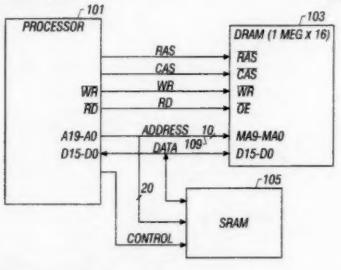
partitioning the hard disk drive into at least one system disk drive for storing system files therein, a data disk drive, a system buffer space and a read/write table; and

selectively operating the computer in one of an unrestricted mode, where storing of the system files and modifying of the system files in the system disk drive by the computer are permitted, and a restricted mode, where modified portions of the system files in the system disk drive are stored by the computer in the system buffer space instead of the system disk drive to maintain the system files in the system disk drive in their initial form and where the read/write table is updated by the computer to record addresses of the modified portions in the system buffer space and addresses of portions of the system files in the system disk drive corresponding to the modified portions therein.

6,016,537
METHOD AND APPARATUS FOR ADDRESS MULTIPLEXING TO SUPPORT VARIABLE DRAM SIZES

John P. Hansen; Robert Paul Gittinger, and Ronald W. Stence, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 7, 1997, Appl. No. 813,734
Int. Cl.[7] G06F *12/02*
U.S. Cl. 711—211 **17 Claims**



1. A processor comprising:

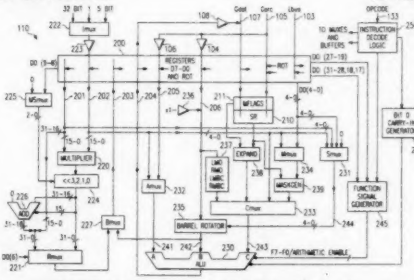
a first output means, receiving address bit A_n, for providing a first line of an address bus with the address bit A_n and for providing the address bit A_n to a second output means; and

the second output means for receiving the address bit A_n from the first output means and an adjacent address bit, and for outputting to an adjacent line of the address bus the adjacent address bit during the one time period and the address bit A_n during another time period, the address bit A_n being part of one of a row address and a column address and the adjacent address bit being part of the other of the row address and the column address.

6,016,538
METHOD, APPARATUS AND SYSTEM FORMING THE SUM OF DATA IN PLURAL EQUAL SECTIONS OF A SINGLE DATA WORD

Karl M. Guttag, Missouri City, and Christopher J. Read, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1993, Appl. No. 160,119
Int. Cl.[7] G06F *15/00*
U.S. Cl. 712—32 **35 Claims**



1. A method for forming a sum of data in 2^N equal sections of a single data word comprising the steps of for each M from 1 to N:

forming an Mth mask having bits of a first digital state filling M odd alternate sections and bits of a second digital state filling M even alternate sections, said second digital state being opposite to said first digital state;

masking a prior sum data word by a first mask thereby forming a prior sum masked data word, the prior sum data word for M=1 being the single data word;

rotating the prior sum data word by M sections;

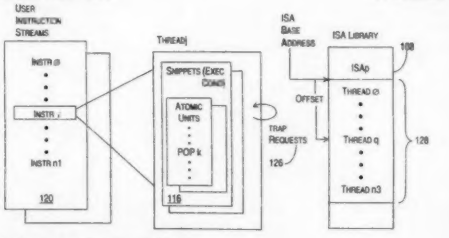
masking the rotated prior sum data word by the Mth mask thereby forming a rotated prior sum masked data word;

summing the prior sum masked data word and the rotated prior sum masked data word thereby forming a sum data word, a last sum data word being the sum of data in 2^N equal sections of the single data word.

6,016,539
DATAPATH CONTROL LOGIC FOR PROCESSORS HAVING INSTRUCTION SET ARCHITECTURES IMPLEMENTED WITH HIERARCHICALLY ORGANIZED PRIMITIVE OPERATIONS

Donald L. Sollars, Milpitas, Calif., assignor to TeraGen Corporation, San Jose, Calif.

Filed Nov. 3, 1997, Appl. No. 963,345
Int. Cl.[7] G06F *9/00*
U.S. Cl. 712—200 **13 Claims**



1. An apparatus comprising:

a datapath that operates to execute primitive operations;

a plurality of control units, including a primary control unit and at least one auxiliary control unit, coupled to each other and to the datapath, to control the datapath to selectively execute a plurality of hierarchically organized primitive operations to effectuate execution of user instruction streams constituted with instructions of an instruction set architecture (ISA), each instruction of the ISA being implemented with one or more hierarchical organization units of said hierarchically organized primitive operations, and the primary control unit having primary responsibility for controlling the datapath including scheduling execution of said hierarchical organization units of said hierarchically organized primitive operations, with the at least one auxiliary control unit assisting the primary control unit in at least dynamic decision variable evaluations to determine execution flow among said hierarchical organization units of said hierarchically organized primitive operations.

6,016,540

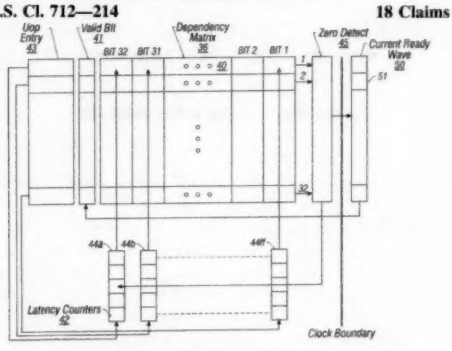
METHOD AND APPARATUS FOR SCHEDULING INSTRUCTIONS IN WAVES

Nazar Zaidi, San Jose; Gary Hammond, Campbell, and Ken Shoemaker, Los Altos Hills, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 8, 1997, Appl. No. 780,249

Int. Cl.[7] G06F *9/38*

U.S. Cl. 712—214 **18 Claims**



1. A method for scheduling instructions for dispatch to an execution unit, said method comprising the steps of:

a) receiving a plurality of instructions;

b) generating a dependency vector for each instruction, wherein the dependency vector has a bit set that indicates each instruction on which the instruction is dependent;

c) determining the instructions that are ready for execution by identifying each instruction that has no bits set in its corresponding dependency vector;

d) clearing the bits in each of the dependency vectors that correspond to the instructions ready for execution;

e) periodically dispatching at least some of the instructions ready for execution until all instructions identified in step c) have been dispatched; and

f) repeating at least steps c) through e).

6,016,541

INSTRUCTION CONTROLLING SYSTEM AND METHOD THEREOF

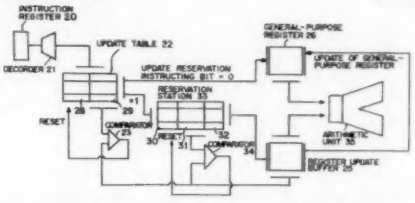
Kyoko Tashima; Takeo Asakawa, and Aiichiro Inoue, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 17, 1998, Appl. No. 42,797

Claims priority, application Japan, Oct. 2, 1997, 9-269702

Int. Cl.[7] G06F *15/00*

U.S. Cl. 712—217 **7 Claims**



1. An instruction controlling system for performing out-of-order instruction control, comprising:

register registering data used for executing an instruction;

instruction register outputting a logical address of said register, which is used for executing the instruction;

decoding unit decoding the logical address output from said instruction register;

register update buffer temporarily storing the data to be registered to said register;

update table registering an address in said register update buffer, to which data for updating said register is registered, and an update reservation instructing bit indicating whether or not an update operation of contents of a corresponding address in said register according to the data registered to said register update buffer, is reserved, in correspondence with the address in said register; and

reservation station registering the address in said register, the address in said register update buffer, and the update reservation instructing bit by making a correspondence between them, assigning priorities for executing corresponding instructions to entries corresponding to contents of each registration, and transmitting an address of data to be processed to said register update buffer, if the update operation of contents of said register is reserved, wherein:

when the instruction is executed, the update reservation instructing bit in said update table, which corresponds to the address output from said instruction register, is referenced;

an arithmetic operation is performed by using the data registered to said register if said register is updated; and

the arithmetic operation is performed by using the data registered to said register update buffer if the update operation of said register is reserved.

6,016,542

DETECTING LONG LATENCY PIPELINE STALLS FOR THREAD SWITCHING

Robert Steven Gottlieb, Sunnyvale, and Michael Paul Corwin, Palo Alto, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

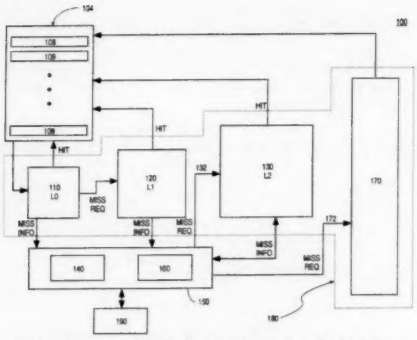
Filed Dec. 31, 1997, Appl. No. 1,552

Int. Cl.[7] G06F *9/38*

U.S. Cl. 712—225 **12 Claims**

1. An apparatus for detecting a thread switch condition in a processor having one or more processor registers and an associated memory system including one or more caches and a main memory, the apparatus comprising:

a load tracking module, the load tracking module to monitor loads that return data to the processor registers, including bus requests generated in response to loads that miss in one or more of the caches;



a cache miss register including entries, each of which is associated with one of the processor registers; and

a mapping module coupled to the load tracking module and the cache miss register, the mapping module to map a bus request to a register and to set a bit in a cache miss register entry associated with the register when the bus request is directed to a higher level structure in the memory system.

6,016,543

MICROPROCESSOR FOR CONTROLLING THE CONDITIONAL EXECUTION OF INSTRUCTIONS

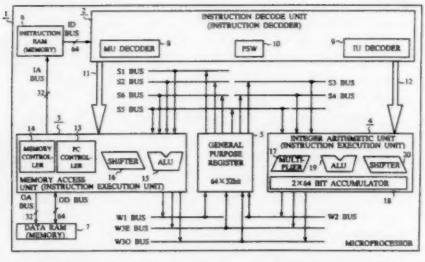
Kazumasa Suzuki; Atsushi Mohri; Akira Yamada, and Toyohiko Yoshida, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1997, Appl. No. 942,295

Claims priority, application Japan, May 14, 1997, 9-124525; May 14, 1997, 9-124526

Int. Cl.[7] G06F *11/14*

U.S. Cl. 712—233 **19 Claims**



1. A microprocessor for executing conditional execution instructions, comprising:

a memory section comprising an instruction RAM for storing instructions including the conditional execution instructions forming a program and a data RAM for storing data;

an instruction decoder, connected to the memory section, for decoding the instructions;

control registers for storing information to control execution of the instructions;

a plurality of registers for storing the data;

an operation unit for performing arithmetic operations;

instruction execution units, connected to the instruction decoder, for executing a preceding instruction and a current instruction simultaneously and/or in parallel according to output from the instruction decoder;

an execution halt circuit for temporarily halting the further execution of the current instruction when a data hazard is detected between the preceding instruction and the current instruction in the program;

a conditional execution decision circuit for judging whether the current instruction is being executed or not; and

a conditional execution control circuit for canceling the further execution of the preceding instruction when the conditional execution decision circuit judges that the current instruction is not being executed, so that the further execution of the current instruction is resumed.

6,016,544

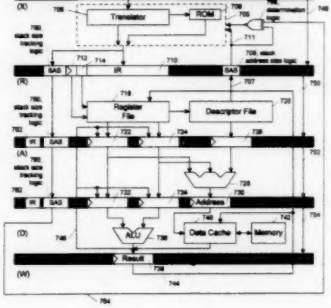
APPARATUS AND METHOD FOR TRACKING CHANGES IN ADDRESS SIZE AND FOR DIFFERENT SIZE RETRANSLATE SECOND INSTRUCTION WITH AN INDICATOR FROM ADDRESS SIZE

G. Glenn Henry, and Terry Parks, both of Austin, Tex., assignors to IP First LLC, Fremont, Calif.

Filed Jun. 9, 1997, Appl. No. 871,040

Int. Cl.[7] G06F *9/38*

U.S. Cl. 712—234 **42 Claims**



1. An apparatus for loading a stack segment register within a pipeline processor, the apparatus comprising:

a translator, within a translate stage of the pipeline processor, for translating a first macro instruction into a first sequence of micro instructions, and a second macro instruction into a second sequence of micro instructions;

a register file, connected to said translator, said register file further comprising a stack segment register, said stack segment register for storing a descriptor which indicates whether stack operations are of a first bit size or of a second bit size;

stack address size logic, connected to said register file, and to said translator, for providing an indicator to said translator that current stack operations are of said first bit size or of said second bit size;

stack size tracking logic, connected to said translator, and associated with said second sequence of micro instructions, following said first sequence of micro instructions in the pipeline processor, for tracking, in processing stages after said translate stage, whether stack operations were of said first bit size or of said second bit size at the time said second sequence of micro instructions were translated; and

determination logic, connected to said stack size tracking logic, and to said stack address size logic, for determining whether said current stack operations and said tracked stack operations are both of said first bit size or of said second bit size, and if

not of the same size, for providing a signal to the processor to ignore said second sequence of micro instructions, and to retranslate said second macro instruction using said indicator from said stack address size logic.

6,016,545

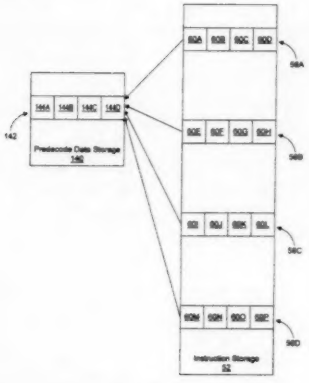
REDUCED SIZE STORAGE APPARATUS FOR STORING CACHE-LINE-RELATED DATA IN A HIGH FREQUENCY MICROPROCESSOR

Rupaka Mahalingaiah; Andrew McBride, and Thang M. Tran, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 16, 1997, Appl. No. 991,694

Int. Cl.[7] G06F *9/38*

U.S. Cl. 712—238 **23 Claims**



1. A microprocessor comprising:

an instruction cache including an instruction storage wherein said instruction storage includes N cache storage locations, and wherein each of said N cache storage locations is configured to store a cache line, and wherein said instruction cache is organized into cache rows, wherein a first cache row is selectable in response to an input address, and wherein each of said cache rows includes one or more of said N cache storage locations; and

a second unit coupled to said instruction cache, wherein said second unit includes a second storage, wherein said second storage includes (N/M) data storage locations, wherein N and M are positive integers greater than zero and (N/M) is an integer less than N, and wherein each one of said (N/M) data storage locations within said second storage corresponds to M of said N cache storage locations within said instruction storage, and wherein each of said M of said N storage locations occupies a same position within different cache rows, and wherein data stored within said one of said (N/M) data storage locations corresponds to a first cache line stored within one of said M cache storage locations within said instruction storage, and wherein said second storage is organized into data rows, and wherein a first data row is selectable in response to said input address, and wherein each of said data rows includes one or more of said (N/M) data storage locations, and wherein a first number of said one or more of said (N/M) data storage locations in each of said data rows is equal to a second number of said one or more of said N storage locations in said cache row.

6,016,546

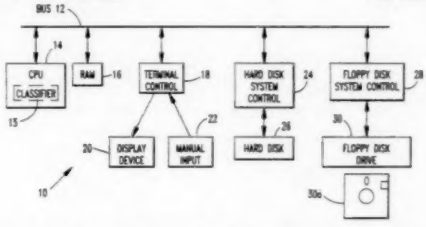
EFFICIENT DETECTION OF COMPUTER VIRUSES AND OTHER DATA TRAITS

Jeffrey Owen Kephart, Cortlandt Manor, N.Y.; Alexandre Guy Georges Morin, Thonon-les-Bains, France; Gregory Bret Sorkin, New York, N.Y., and Joseph Warreb Wells, Newbury Park, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 10, 1997, Appl. No. 890,013

Int. Cl.[7] G06F *13/00*

U.S. Cl. 713—200 **30 Claims**



1. A method of detecting the likelihood of the presence of any of a first set of known data traits in a data string, by use of a second set G of generic features and a third set S of signatures, wherein the generic features and the signatures are characteristic of said first set of data traits, said method comprising the steps of:

a) loading the set G into a memory of a computer,

b) locating occurrences within the data string of each generic feature in said set G,

c) applying a first mapping from the occurrences located during step b) to obtain a subset S* of S,

d) loading all signatures from the subset S* into a memory of said computer,

e) locating occurrences within said data string of all signatures from the subset S*, and

f) applying a second mapping from the occurrences located during step e) to identify a set of data traits that are likely to be present in the data string.

6,016,547

DATA PROCESSING APPARATUS WITH PROGRAM ALLOCATING SECTION FOR SELECTIVELY ALLOCATING PROGRAMS IN FIRST AND SECOND MEMORY

Chihiro Ono, Higashine, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of application No. 08/872,771, Jun. 10, 1997, which is a division of application No. 08/802,165, Feb. 18, 1997, which is a division of application No. 08/435,132, May 5, 1995, Pat. No. 5,798,885. This application Apr. 24, 1998, Appl. No. 65,482.

Claims priority, application Japan, Jun. 6, 1994, 6-123743; Jul. 6, 1994, 6-125123; Oct. 6, 1994, 6-128617

Int. Cl.[7] G06F *1/32;12/02*

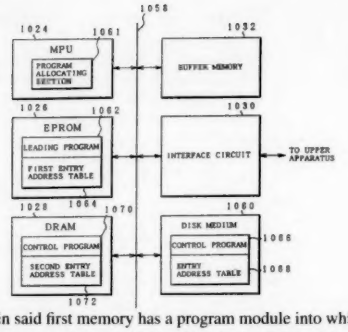
U.S. Cl. 713—300 **19 Claims**

1. A data processing apparatus comprising:

a processing section for executing programs;

a program storing section which has a first memory space using a first memory of a small electric power consumption and a second memory space using a second memory of a large electric power consumption as memory spaces to store the programs which are used by said processing section and in which each of the peculiar programs has been stored; and

a program allocating section for selectively allocating the program included in said second memory space of said program storing section and the program included in said first memory space to said processing section and executing said allocated program;



wherein said first memory has a program module into which said predetermined program is stored and a first entry address table to store an entry address of said program module, and

said second memory has at least a second entry address table into which the entry address of said program module is loaded from said first entry address table in said first memory.

6,016,548

APPARATUS FOR CONTROLLING DUTY RATIO OF POWER SAVING OF CPU

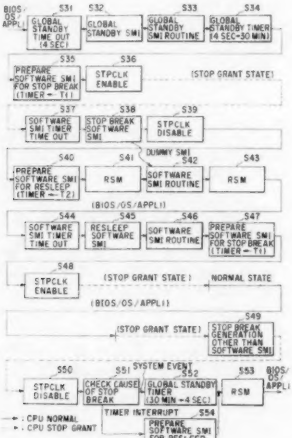
Nobutaka Nakamura, and Masayo Yamaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Division of application No. 08/364,720, Dec. 27, 1994, Pat. No. 5,706,407. This application Jul. 15, 1997, Appl. No. 893,926.

Claims priority, application Japan, Dec. 28, 1993, 5-351165; Sep. 30, 1994, 6-235794; Sep. 30, 1994, 6-238121

Int. Cl.[7] G06F *1/00;17/20*

U.S. Cl. 713—323 **17 Claims**



1. A computer system, comprising:

an external clock generator for generating an external clock signal having a first clock speed;

a central processing unit (CPU) for receiving the external clock signal and comprising an internal clock generator for generating an internal clock signal having a second clock speed based on the external clock signal, the second clock speed being the same as or faster than the first clock speed;

a timer for producing a time-out signal in accordance with a timing value in order to control power saving of the CPU;

first means for setting the timer with a first timing value and for switching the CPU from a normal state in which the external and the internal clock signals are running and commands are executable to a stop grant state in which the external and the internal clock signals are running, supply of the internal clock signal to internal logics of the CPU is stopped, and no command is executable in response to a first-time out signal from the timer; and

second means for setting the timer with a second timing value and for switching the CPU from the stop grant state to the normal state in response to a second time-out signal from the timer, thereby the first means and the second means repetitively and intermittently switching the CPU between the normal state and the stop grant state.

6,016,549

PERIPHERAL UNIT HAVING AT LEAST TWO SEQUENCER CIRCUITS CONFIGURED TO CONTROL DATA TRANSFERS FOR POWER SAVING

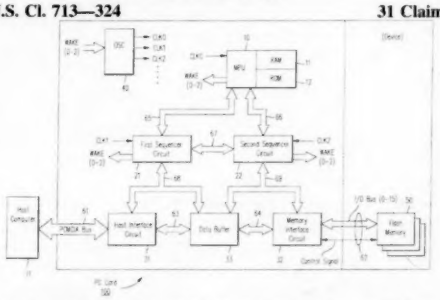
Takuji Matsushiba, Ebina, and Satoshi Karube, Kamakura, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1997, Appl. No. 863,898

Claims priority, application Japan, Jun. 14, 1996, 8-153657

Int. Cl.[7] G06F *1/32*

U.S. Cl. 713—324 **31 Claims**



1. A peripheral unit, which is adapted to be coupled to a computer system, comprising:

an MPU;

a sequencer circuit coupled to said MPU, wherein said MPU and said sequencer circuit are each configured to be selectively activated to perform a specific function and subsequently deactivated upon the completion of said specific function, and wherein said sequencer circuit comprises a first sequencer circuit configured to control data transfers and a second sequencer circuit configured to control data transfers; and

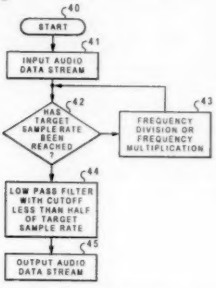
a clock generating circuit coupled to said MPU and said sequencer circuit, wherein said clock generating circuit is configured to provide said MPU, when activated, a first clock signal, and to provide said first sequencer circuit, when activated, a second clock signal, and to provide said second sequencer circuit, when activated, a third clock signal, and, wherein said clock generating circuit is further configured to halt said first clock signal to said MPU when said MPU is deactivated, to halt said second clock signal to said first sequencer circuit when said first sequencer circuit is deactivated, and to halt said third clock signal to said second sequencer circuit when said second sequencer circuit is deactivated.

6,016,550

METHOD AND APPARATUS FOR AUDIO SAMPLE RATE CONVERSION WITHIN A DATA-PROCESSING SYSTEM

George Dimitrios Kokkosoulis, and Daniel Anthony Temple, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1997, Appl. No. 982,608
Int. Cl.[7] G06F *5/00*
U.S. Cl. 713—400 12 Claims



1. A method for providing audio sample rate conversion within a data-processing system, said method comprising the steps of:

accepting an incoming audio data stream having an input sample rate;

selectively performing a plurality of frequency multiplications or a plurality of frequency divisions to data samples of said audio data stream until a target sample rate is reached, wherein exact numbers of said frequency multiplications and said frequency divisions are determined by a prime factorization of a sample rate ratio;

filtering said data samples from said audio data stream with a lowpass filter; and

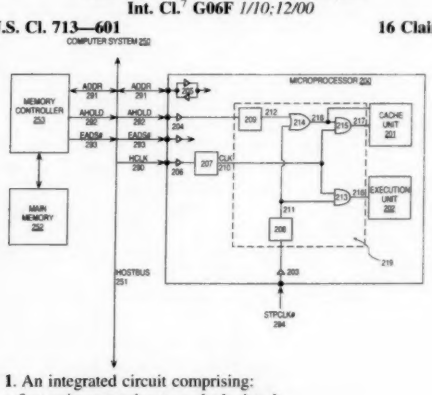
outputting said data samples from said audio data stream at said target sample rate.

6,016,551

METHOD AND APPARATUS FOR MASKING AND UNMASKING A CLOCK SIGNAL IN AN INTEGRATED CIRCUIT

Gil Stoler, Kiryat Ata, Israel, and Tosaki Nakanishi, Hillsboro, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 19, 1997, Appl. No. 994,303
Int. Cl.[7] G06F *1/10;12/00*
U.S. Cl. 713—601 16 Claims



1. An integrated circuit comprising:

a first unit responsive to a clock signal;

a second unit responsive to said clock signal;

a first buffer for receiving a first signal indicating when said clock signal is to be masked;

a second buffer for receiving a second signal indicating when said first unit requires said clock signal; and

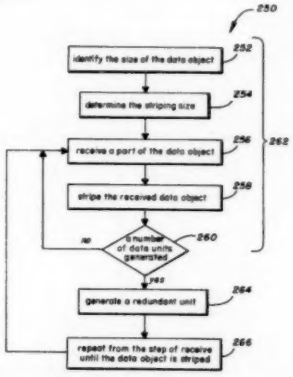
clock masking circuitry, coupled to said first unit, said second unit, said first buffer and said second buffer, for receiving said clock signal, masking said clock signal to said first and second units based on said first signal and unmasking said clock signal to said first unit based on said second signal while said clock signal to said second unit remains masked.

6,016,552

OBJECT STRIPING FOCUSING ON DATA OBJECT

Jack Y. B. Lee, Kwun Tong, and Po C. Wong, One Shatin, both of The Hong Kong Special Administrative Region of the People's Republic of China, assignors to The Chinese University of Hong Kong, Shatin, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Jun. 6, 1997, Appl. No. 870,898
Int. Cl.[7] G06F *11/00*
U.S. Cl. 714—6 16 Claims



1. A method for generating stripe units in a stripe for a data object which can be of any size, wherein:

a stripe is defined as having one or more data units and one or more redundant units with the redundant units being generated by the data units,

a stripe unit can be a data unit or a redundant unit; and

the stripe units are to be stored in a plurality of storage media; and

the method comprising the steps of:

striping a part of the data object that has not been striped before into at least one data unit;

generating at least one redundant unit from the immediately striped at least one data unit to produce a stripe; and

repeating from the step of striping until the entire data object is striped;

wherein the step of striping further comprises the steps of:

identifying the size of the data object:

determining the striping size based on the size of the data object;

receiving at least a part of the data object, with the size of that part being at least equal to the striping size;

striping the received data object into a data unit based on the striping size; and

if the part of the data object that has not been striped before is to be striped into more than one data unit, then repeating from the step of receiving to generate the data units.

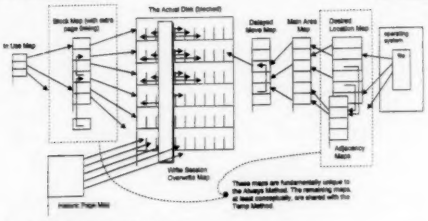
6,016,553
METHOD, SOFTWARE AND APPARATUS FOR SAVING, USING AND RECOVERING DATA

Eric Schneider, Plymouth; Chuck Ferril, Shorewood; Doug Wheeler, Plymouth; Larry Schwartz, Coon Rapids, and Edward Bruggeman, Chaska, all of Minn., assignors to Wild File, Inc., Plymouth, Minn.

Continuation-in-part of application No. 09/039,650, Mar. 16, 1998, which is a continuation-in-part of application No. 08/924,198, Sep. 5, 1997, abandoned. This application Jun. 26, 1998, Appl. No. 105,733.

Int. Cl.[7] G06F *11/00*

U.S. Cl. 714—21 **40 Claims**



1. A method, comprising:

keeping a record of the roles of some disk locations X and Y in order to preserve the original data contents of location X;

in the event that an operating system requests overwriting of original data at location X with new data, diverting the storing of the new data to disk location Y instead of taking the place of the original data at location X such that the original data remains in disk location X;

consulting the record in the event the operating system requests a read of location X in order to divert the read to location Y;

reconstructing a prior state of data stored on the disk corresponding to an earlier time by (i) reading data from the disk which the operating system has not requested to be overwritten before the prior state occurred, (ii) reading original data retained on the disk, and (iii) combining the data read from both sources (i) and (ii); and

automatically recycling the disk locations that are associate with the original data overwritten by the operating system such as X to receive the new data of a subsequent diverted write by the operating system.

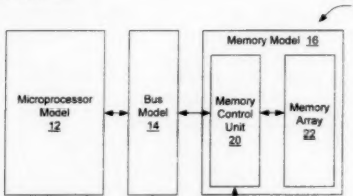
6,016,554
METHOD FOR EVENT-RELATED FUNCTIONAL TESTING OF A MICROPROCESSOR

Joseph C. Skrovan, Buda, and Allan Parker, Austin, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 28, 1997, Appl. No. 901,576

Int. Cl.[7] G06F *11/00*

U.S. Cl. 714—25 **31 Claims**



1. A method for performing functional testing upon a microprocessor, comprising:

providing a model of the microprocessor adapted to perform an activity of interest and to respond to a control signal, and wherein the activity of interest occurs over a plurality of clock cycles;

producing a trigger event signal from the microprocessor model prior to initiating performance of the activity of interest;

using the trigger event signal to generate the control signal during one of the plurality of clock cycles such that the microprocessor model responds to the control signal;

comparing a test result produced during the activity of interest to an expected result;

repeating the producing, using, and comparing steps until the microprocessor model has responded to the control signal during each of the plurality of clock cycles occurring during the activity of interest; and

verifying proper operation of the microprocessor during the activity of interest by matching the test result to the expected result during each execution of the comparing step.

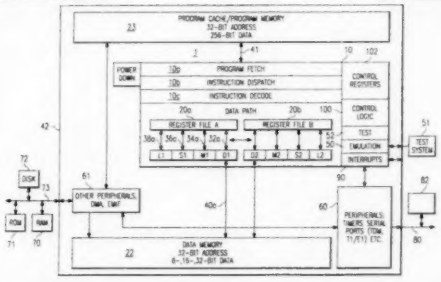
6,016,555
NON-INTRUSIVE SOFTWARE BREAKPOINTS IN A PROCESSOR INSTRUCTION EXECUTION PIPELINE

Douglas E. Deao, Brookshire, and Natarajan Seshan, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 19, 1997, Appl. No. 974,744

Int. Cl.[7] G06F *15/78*

U.S. Cl. 714—35 **20 Claims**



1. A method for debugging a processor within a data processing system, the processor having an instruction execution pipeline with at least a first pipeline phase followed by a second pipeline phase, comprising the steps of:

forming a software breakpoint instruction within a sequence of instructions by replacing a field within an operational instruction with a predetermined breakpoint code;

fetching and executing a portion of the sequence of instructions in the processor instruction execution pipeline in a normal operational manner to initiate a plurality of overlapping operations in the instruction pipeline;

fetching and partially executing the software breakpoint instruction in the first pipeline phase of the instruction pipeline;

halting the normal operation of the instruction pipeline in response to decoding the breakpoint code in the second pipeline phase of the instruction pipeline;

performing a debug function in response to decoding the breakpoint code; and

restarting the normal operation of the instruction pipeline after the step of performing a debug function without refetching the operational instruction which was replaced by the software

breakpoint instruction in a manner such that the operational instruction is executed as if the field within the operational instruction had not been replaced with the predetermined breakpoint code.

6,016,556

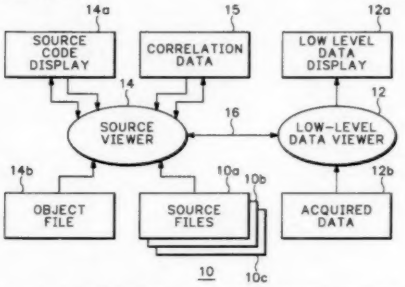
SYSTEM FOR IDENTIFYING AN ACQUISITION SAMPLE CORRESPONDING TO A SOURCE CODE STATEMENT

Robert J. Heath, Aloha, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Jul. 17, 1997, Appl. No. 895,544

Int. Cl.[7] G06F *11/00*

U.S. Cl. 714—38 **10 Claims**



1. A system for identifying an acquisition sample corresponding to a source code statement, comprising:

a user-operable data entry device for selecting a particular source code statement;

a correlator for correlating the address of an acquisition sample to said selected source code statement; and

a search system for initiating, in response to said selection of said particular source code statement, a search in acquisition sample data for an acquisition sample having an address range within a range corresponding to a correlated range for said selected source code statement;

wherein said correlator comprises a look-up table;

wherein said command receiving means indicates either forward searches or backwards searches within the acquisition sample data;

wherein said pointer device is employed by a user to select a source code statement for which a corresponding acquisition sample is to be located;

wherein said pointer device has first and second selectors, and wherein on actuation of the first selector, said search system searches in a first direction and on actuation of the second selector, said search system searches in a second direction.

6,016,557

METHOD AND APPARATUS FOR NONINTRUSIVE PASSIVE PROCESSOR MONITOR

Marlon Zbigniew Kasprzyk, Winfield, and Paul K. Wolfe, Naperville, both of Ill., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Sep. 25, 1997, Appl. No. 938,438

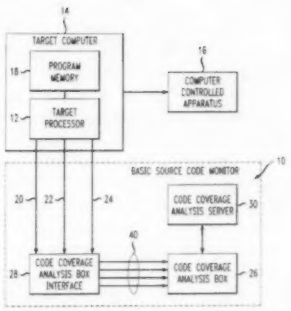
Int. Cl.[7] G06F *11/00*

U.S. Cl. 714—38 **42 Claims**

1. An apparatus for monitoring the execution of an object coded computer program by a processor, comprising:

means for passively detecting the actions taken by the processor while executing the object coded program;

means responsive to said passively detecting means for determining during execution of the object program by the processor if there is a match between the actions as detected and an associated part of the object code; and



means responsive to said match determining means for displaying an indication of the actions performed and, if there is a match, an indication of the associated part of the object code.

6,016,558

COMMUNICATION EVENT/MESSAGE TRACING METHOD FOR RPC-BASED DISTRIBUTION PROCESSING PROGRAM

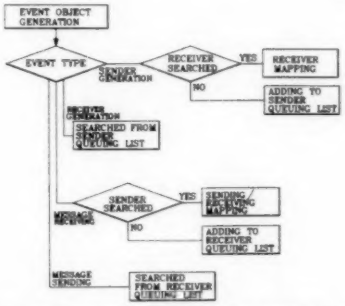
Myung Je Seong; Eun Jeong Lee, and Yeong Wook Cho, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Jan. 14, 1998, Appl. No. 6,905

Claims priority, application Rep. of Korea, Dec. 9, 1997, 97-67117

Int. Cl.[7] G06F *11/00*

U.S. Cl. 714—45 **3 Claims**



1. A communication event/message tracing method for an RPC-based distribution processing program includes the steps of:

a first step in which a program and event list to be traced on an event tracing window of a debugging client is registered by a user and a debugging client reports the start of the event tracing to the debugging server in which a corresponding program exists;

a second step in which the debugging servers reports a break point setting instruction to an event-related RPC library function to the rear debugger in accordance with the report in the first step;

a third step in which the rear debugger sets a break point with respect to the RPC library function of the program in accordance with the instruction of the second step and the result is reported to the debugging server;

a fourth step in which the debugging server reports to the debugging client that the event tracing operation is ready in accordance with the report of the third step;

a fifth step in which the debugging client reports to the rear debugger through the debugging server so that the debugging client performs all programs related to the event tracing program in accordance with the report of the fourth step, and the rear debugger performs the program;

a sixth step in which the ready debugger judges whether the rear debugger reaches the position where the break point is set during the operation of the program of the fifth step;

a seventh step in which the fifth step is repeatedly performed when the break point does not reach the set position as a result of the judgement of the sixth step and the program is stopped at a corresponding position when the same reaches the set position, and the result thereof is reported to the debugging client through the debugging server;

an eighth step in which the debugging client compares the break point with the event list in accordance with the report of the seventh step and judges whether the event is generated; and

a ninth step in which the fifth step is repeatedly performed when the event is not generated as a result of the judgement of the eighth step and a receiving message and sending message of the sender and receiver are mapped when the event is generated, and the generation of the event is displayed on the event tracing window.

6,016,559

MULTIFUNCTIONAL INTERGRATED ELECTRONIC PRODUCT AND METHOD FOR PREVENTING OPERATION FAILURE OF THE SAME

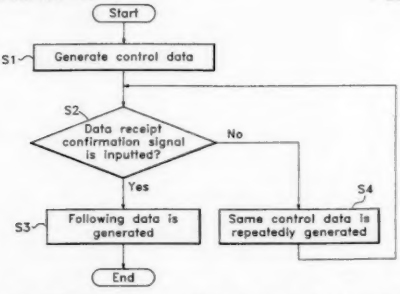
Yang Sung Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 29, 1997, Appl. No. 960,245

Claims priority, application Rep. of Korea, Oct. 30, 1996, 96-50294

Int. Cl.[7] **G06F** *9/00*

U.S. Cl. 714—48 **7 Claims**



1. A multifunctional integrated electronic product, comprising:

a main microcomputer having at least one input/output port for receiving and sending data, said main microcomputer generating a control data signal to control an external device;

a data bus having one end coupled to said input/output port of said main microcomputer and a second end; and

a sub microcomputer having at least one input/output port connected to said second end of said data bus and receiving said control data signal from said main microcomputer, said sub microcomputer determining the presence of an error in said control data signal and transmitting a data receipt confirmation signal to said main microcomputer when no error is detected, and transmitting a data error generating signal to said main microcomputer when an error is detected, said sub microcomputer transmitting one of said confirmation signal and said data error generating signal without receiving a request for either of said signals from said main microcomputer, wherein said main microcomputer transmits following data when no errors are present in the control data signal.

6,016,560

SEMICONDUCTOR MEMORY, MEMORY DEVICE, AND MEMORY CARD

Masashi Wada, Kodaira; Takao Okuba, Ome, and Takeshi Furuno, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

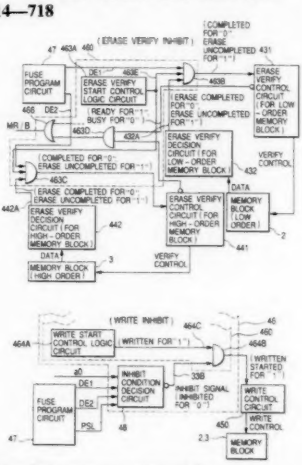
PCT No. PCT/JP96/01447, § 371 Date Mar. 17, 1998, § 102(e) Date Mar. 17, 1998, PCT Pub. No. WO97/00518, PCT Pub. Date Jan. 3, 1997

PCT Filed May 29, 1996, Appl. No. 981,094

Claims priority, application Japan, Jun. 14, 1995, 7-171518

Int. Cl.[7] **G01R** *31/28;* **G11C** *7/00*

U.S. Cl. 714—718 **11 Claims**


FUSE PROGRAM CIRCUIT
ERASE VERIFY START CONTROL LOGIC CIRCUIT
ERASE VERIFY DECISION CIRCUIT (FOR LOW - ORDER MEMORY BLOCK)
ERASE VERIFY CONTROL CIRCUIT (FOR HIGH - ORDER MEMORY BLOCK)
ERASE VERIFY CONTROL CIRCUIT (FOR LOW - ORDER MEMORY BLOCK)
ERASE VERIFY DECISION CIRCUIT (FOR HIGH - ORDER MEMORY BLOCK)
MEMORY BLOCK (LOW ORDER)
MEMORY BLOCK (HIGH ORDER)
VERIFY CONTROL
DATA
WRITE START CONTROL LOGIC CIRCUIT
INHIBIT CONDITION DECISION CIRCUIT
WRITE CONTROL CIRCUIT
WRITE CONTROL
MEMORY BLOCK

1. A semiconductor memory comprising:

a plurality of memory blocks having a plurality of memory cells;

a data input/output buffer for receiving data written in the memory blocks from an external unit and for outputting data read out of the memory blocks to an external unit;

control means for controlling the rewriting and reading of data for the memory cells;

storage means for designating defective memory blocks included in said plurality memory blocks; and

detection means for detecting the defective memory blocks designated by said storage means in accordance with a received address signal; wherein

said control means inhibits a data rewrite operation for an instruction for a data rewrite operation when said detection means detects an access to a defective memory block and inhibits a data output operation of said data input/output buffer for an instruction for a data read operation.

6,016,561

OUTPUT DATA COMPRESSION SCHEME FOR USE IN TESTING IC MEMORIES

Fariborz F. Roohparvar, Cupertino; Allahyar Vahidi Mowlavi, Santa Clara, both of Calif.; Mark A. Hawes, and Gregory L. Cowan, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

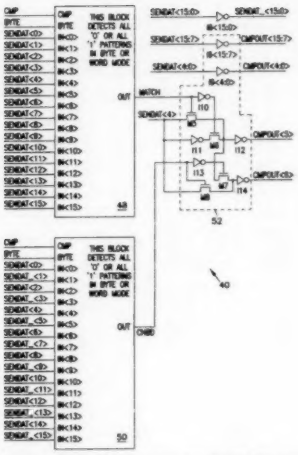
Continuation of application No. 08/681,527, Jul. 22, 1996, Pat. No. 5,787,097. This application Jun. 18, 1998, Appl. No. 99,831.

Int. Cl.[7] **G01R** *31/28*

U.S. Cl. 714—720 **35 Claims**

17. A pattern recognition circuit, comprising:

a first detection circuit which detects whether or not a set of x number of data bits are arranged in a pattern in which all of the x number of data bits are identical and which generates a MATCH signal in response thereto; and



an output circuit, coupled to receive the MATCH signal, which generates y number of output data bits which are arranged in a pattern indicative of whether the set of x data bits are identical or are arranged in another pattern, wherein the y number is less than the x number.

6,016,562

INSPECTION DATA ANALYZING APPARATUS FOR IN-LINE INSPECTION WITH ENHANCED DISPLAY OF INSPECTION RESULTS

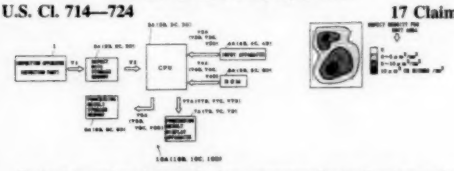
Yoko Miyazaki; Nobuyoshi Hattori; Junko Izumitani, and Masahiko Ikeno, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/664,431, Jun. 18, 1996, abandoned. This application Aug. 28, 1997, Appl. No. 919,166.

Claims priority, application Japan, Jan. 12, 1996, 8-004227

Int. Cl.[7] **G01R** *31/28;* **G06F** *11/10*

U.S. Cl. 714—724 **17 Claims**



7. An inspection data analyzing apparatus for in-line inspection which analyzes detected defect data signals which are obtained on a semiconductor wafer by an inspection apparatus after any one of semiconductor manufacturing steps is complete, comprising:

(a) means for receiving said detected defect data signals and for obtaining data signals which provide defect densities per predetermined unit area, from said detected defect data signals;

(b) means for calculating and generating first drawing data signals based on said data signals which are obtained by said data signals receiving and obtaining means (a);

(c) means for generating second drawing data signals which provide a chip arrangement; and

(d) means for graphically displaying said first drawing data signals obtained by said calculating means (b), and said chip arrangement based on said second drawing data signals generated by said generating means (c).

16. An inspection data analyzing apparatus for in-line inspection which analyzes detected defect data signals which are obtained on a semiconductor wafer including at least one chip by an inspection apparatus after an optional point of time after two or more steps of inspection steps are complete, comprising:

(a) means for receiving said detected defect data signals and for obtaining defect density data signals which provide defect densities per chip based on said detected defect data signals, to thereby generate first drawing data signals for display values of said defect density data signals as numerical values, and second drawing data signals which provide a chip arrangement map and a defect distribution map of said semiconductor wafer as they overlap each other, for each one of inspection steps; and

(b) means for displaying both said first drawing data signals and said second drawing data signals which are obtained by said receiving and obtaining means (a), for each one of said inspection steps.

6,016,563

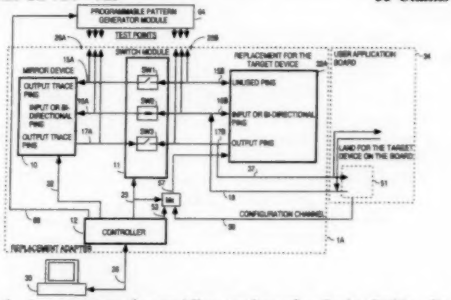
METHOD AND APPARATUS FOR TESTING A LOGIC DESIGN OF A PROGRAMMABLE LOGIC DEVICE

Evgeny G. Fleisher, 1149 Danbury Dr., San Jose, Calif. 95129

Filed Dec. 30, 1997, Appl. No. 1,109

Int. Cl.[7] **G01R** *31/28;* **G06F** *11/00*

U.S. Cl. 714—725 **35 Claims**



1. An apparatus for enabling testing of a logic device, the apparatus comprising:

a first logic device having a plurality of input terminals and a plurality of output terminals;

a plurality of configurable connections coupled to the first logic device to enable configurable coupling of the first logic device to a second logic device, the second logic device having a plurality of input terminals and a plurality of output terminals corresponding to the input terminals and the output terminals of the first logic device; and

a controller configured to control the plurality of switchable connections to couple the input terminals of the first logic device to corresponding input terminals of the second logic device and to decouple the output terminals of the first logic device from corresponding output terminals of the second logic device.

6,016,564

METHOD OF DESIGN FOR TESTABILITY, METHOD OF DESIGN FOR AVOIDING BUS ERROR AND INTEGRATED CIRCUIT

Toshinori Hosokawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

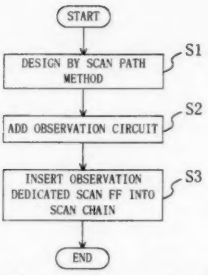
Filed Aug. 26, 1997, Appl. No. 917,555

Claims priority, application Japan, Aug. 28, 1996, 8-226806

Int. Cl.[7] **H04B** *17/00*

U.S. Cl. 714—726 **18 Claims**

1. A method of design for testability of an integrated circuit comprising:



a first step of designing said integrated circuit by a scan path method for attaining testability;

a second step of adding an observation circuit, which observes a signal at a portion difficult to test or a portion impossible to test and outputs said observed signal from an observation dedicated scan flip-flop, to said integrated circuit; and

a third step of inserting said observation dedicated scan flip-flop into a scan chain formed in said first step so that an output signal of said observation circuit is outputted from said integrated circuit through said scan chain.

6,016,565

SEMICONDUCTOR DEVICE TESTING APPARATUS

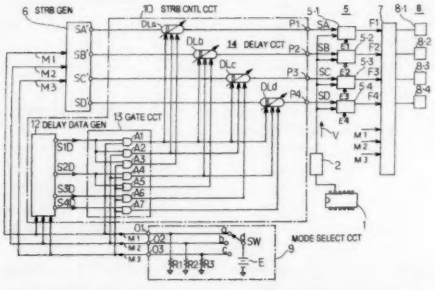
Takeo Miura, Tatebayashi, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Jun. 13, 1997, Appl. No. 874,669

Claims priority, application Japan, Jun. 14, 1996, 8-153779

Int. Cl.[7] G01R *31/28*

U.S. Cl. 714—736 **14 Claims**



1. A semiconductor device testing apparatus wherein a series of test data signals of a predetermined pattern is applied to a semiconductor device to be tested, a read-out data signal read out from said semiconductor device is logically compared with an expected value data signal in a logical comparison circuit, and when the result of comparison is a discord, a failure signal indicating the discord is outputted to be stored in a failure analysis memory,

said semiconductor device testing apparatus comprising:

a plurality of strobe generators generating original strobe signals having the same frequency, respectively;

a plurality of logical comparator circuits, each logical comparator circuit logically comparing a portion of the readout data signal from said semiconductor device latched thereinto by corresponding one original strobe signal with an expected value data signal supplied thereto, and when the result of comparison is a discord, generating a failure signal, the number of said logical comparator circuits being equal to that of said strobe generators;

a strobe control circuit provided between said plurality of strobe generators and said plurality of logical comparator circuits, giving predetermined amounts of delay time to original strobe signals generated from said plurality of strobe generators respectively, thereby controlling timings for latching the read-out data signal from the semiconductor device into the corresponding logical comparator circuits; and

a mode selection circuit at least generating, in each test period of a plurality of test periods constituting one test cycle, a first mode signal which selects a first test mode in which the read-out data signal from the semiconductor device can be latched into the corresponding logical comparator circuits by a new strobe signal of a frequency having the frequency of the original strobe signal multiplied by the number of said strobe generators, and a second mode signal which selects a second test mode in which the read-out data signal from the semiconductor device can be latched into the corresponding logical comparator circuits by a plurality of new strobe signals having the same frequency as that of the original strobe signal and different phases from one another at a plurality of timings.

6,016,566

COMPARATOR FOR SEMICONDUCTOR TESTING DEVICE

Kenji Yoshida, Tokyo, Japan, assignor to Advantest Corp., Tokyo, Japan

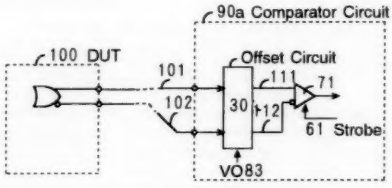
PCT No. PCT/JP97/00102, § 371 Date Feb. 9, 1998, § 102(e) Date Feb. 9, 1998, PCT Pub. No. WO97/27493, PCT Pub. Date Jul. 31, 1997

PCT Filed Jan. 20, 1997, Appl. No. 913,349

Claims priority, application Japan, Jan. 23, 1996, 8-028552

Int. Cl.[7] G01R *31/28*; H01H *61/00*

U.S. Cl. 714—736 **4 Claims**



1. A comparator circuit for a semiconductor test system for testing differential characteristics between differential signals that are output from DUT, comprising:

a first switch which receives one of differential signals from said DUT, and outputs either the differential signal or fixed potential by switching between the two;

a second switch which receives another differential signal from said DUT, and outputs either the differential signal or said fixed potential by switching between the two;

an offset circuit which receives said differential signals from said first and second switches and generates output signals provided with a predetermined offset voltage; and

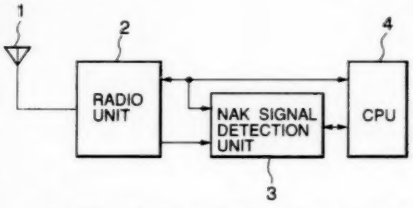
a comparator which receives both of said output signals from said offset circuit and compares therebetween.

6,016,567

RADIO BROADCAST SYSTEM WITH IMPROVED RECEPTION OF AN NAK CODE

Ryuhei Fujiwara, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 21, 1997, Appl. No. 975,596
Claims priority, application Japan, Nov. 25, 1996, 8-313165
Int. Cl.[7] H04L *1/18*
U.S. Cl. 714—748 **4 Claims**



1. A radio broadcast system comprising a base station for transmitting data and a plurality of subsidiary stations located at various portions around said base station, wherein each subsidiary station comprises an error detector for detecting an error in received data, and a system for transmitting a burst retransmission request signal (NAK signal) upon detecting an error in the received data;

wherein, during a predetermined time, the transmitting system in the subsidiary station transmits no signals, except the NAK signal indicating reception of broadcast data containing an error, and

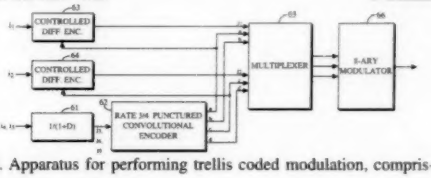
during said predetermined time, if said base station detects the NAK signal or detects a radio carrier having a predetermined time length, said base station responds by retransmitting said data.

6,016,568

HIGH RATE TRELLIS CODING AND DECODING METHOD AND APPARATUS

Jack Keil Wolf, Rancho Mirage, and Ephraim Zehavi, San Diego, both of Calif., assignors to QUALCOMM Incorporated, San Diego, Calif.

Continuation of application No. 08/779,638, Jan. 7, 1997, Pat. No. 5,844,922, which is a continuation of application No. 08/023,789, Feb. 22, 1993, abandoned. This application Jul. 7, 1998, Appl. No. 110,700.
Int. Cl.[7] G06F *11/10*; **H03M** *13/12*
U.S. Cl. 714—792 **3 Claims**



2. Apparatus for performing trellis coded modulation, comprising:

means for receiving a set of bits for transmission;

means for encoding one bit from the set of bits yielding a first symbol and a second symbol;

means for performing first phase modulation of a signal using a first symbol word comprising the first symbol and a first subset of the set of bits, wherein the first subset does not include the one bit; and

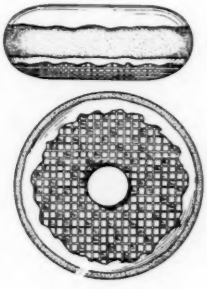
means for performing second phase modulation of the signal using a second symbol word comprising the second symbol and a second subset of the set of bits, wherein the second subset does not include the one bit.

DESIGNS

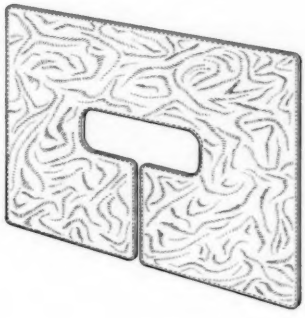
JANUARY 18, 2000

418,963
LOLLYPOP HOLDER
Jens Johnson, 326 Mill Rd., Stamford, Conn. 06903
Filed Jul. 16, 1999, Appl. No. 107,967
Term of patent 14 years
LOC (6) Cl. 01 - *01*
U.S. Cl. D1—105

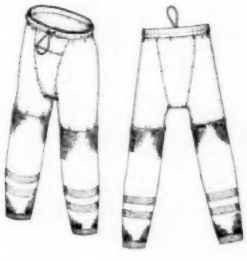
418,964
ICE CREAM DONUT
Uzi Biton, 10658 Locust, Hesperia, Calif. 92345
Filed Mar. 31, 1997, Appl. No. 68,741
Term of patent 14 years
LOC (6) Cl. 01 - *01*
U.S. Cl. D1—120



418,965
SCARF
Beverly Ann Lujan, 1175 Sunnyside Ave., Salt Lake City, Utah 84102
Filed Jan. 22, 1999, Appl. No. 99,528
Term of patent 14 years
LOC (6) Cl. 02 - *05*
U.S. Cl. D2—500



418,966
SPORTS UNDERGARMENT
Daniel Walsh, 166 Carlisle Terr., Ridgewood, N.J. 07450
Filed Jun. 29, 1998, Appl. No. 90,031
Term of patent 14 years
LOC (6) Cl. 02 - *01*
U.S. Cl. D2—712



418,967

PLASTIC TONGUE PROTECTOR

Ed Stengel, R.R. #2, Kemble, Ontario, Canada, N0H 1S0

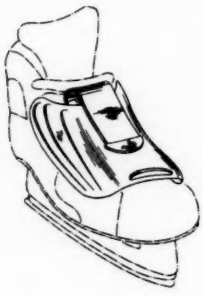
Filed Jan. 14, 1998, Appl. No. 82,080

Claims priority, application Canada, Jul. 18, 1997, 1997-1880

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—946



418,968

SOFT SPIKE FOR GOLF SHOES

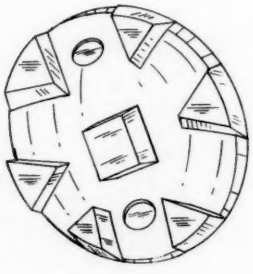
James Parker, Basking Ridge, N.J., assignor to PST Products, Inc., Basking Ridge, N.J.

Filed Aug. 7, 1998, Appl. No. 91,859

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—962



418,969

MOISTURE ABSORBENT SOCK

James B. Marshall, 137 Victoria Avenue, Remuera, Aucland, New Zealand

Filed May 12, 1999, Appl. No. 104,799

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—980

418,970

UMBRELLA

Christine Linmei Chen, and Michael K. Chen, both of Los Angeles, Calif., assignors to Artfarm Umbrella, Inc., Calif.

Filed May 13, 1999, Appl. No. 104,890

Term of patent 14 years

LOC (6) Cl. 03 - *04*

U.S. Cl. D3—5

418,971

KEY RING HOLDER

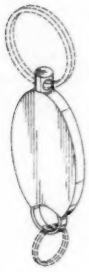
Robert A. Scungio, West Warwick, R.I., assignor to Discovery Marketing and Design, Ltd., Pawtucket, R.I., and DCI Marketing, Inc., Milwaukee, Wis.

Filed Oct. 20, 1998, Appl. No. 95,266

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—207



418,972

BACKPACK

Nancy Gold, Schenectady, N.Y., assignor to Tough Traveler, Schenectady, N.Y.

Filed Jan. 28, 1999, Appl. No. 99,790

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—217

418,973

PAGER CARRIER

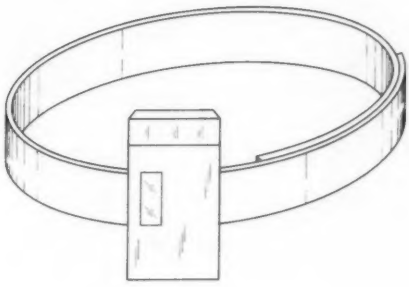
Judith Susana Epstein, 2324 Elden Ave., Costa Mesa, Calif. 92627

Filed Dec. 23, 1998, Appl. No. 98,143

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—218



418,974

COMPACTED CARRY BAG

Maximino Vazquez, New York, N.Y., assignor to Maxworld, Inc., New York, N.Y.

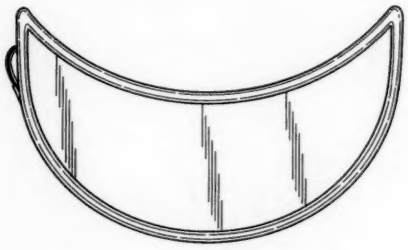
Filed Jun. 23, 1998, Appl. No. 89,867

Term of patent 14 years

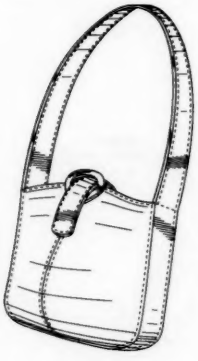
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—226

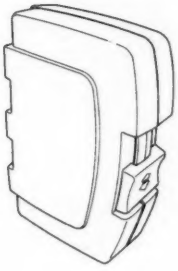
418,975
HANDBAG
Ancela Nastasi, 666 Greenwich St., Suite 707, New York, N.Y. 10014
Filed Mar. 8, 1999, Appl. No. 101,617
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—238



418,976
HANDBAG
Vincent du Sartel, Paris, France, assignor to Louis Vuitton Malletier, S.A., Paris, France
Filed Feb. 19, 1999, Appl. No. 100,879
Claims priority, application France, Aug. 21, 1998, DM/044929
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—243



418,977
TOOL CONTAINER
John P. Streich, Towson, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Aug. 14, 1998, Appl. No. 92,266
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—273

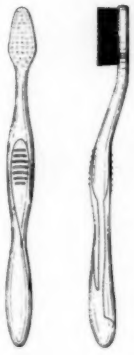


418,978
TRAVEL CASE
Raymond P. Pennoyer, Jr., 97 Sturbridge La., Trumbull, Conn. 06610
Filed Nov. 5, 1998, Appl. No. 96,125
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—273

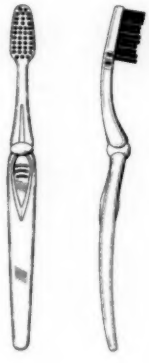
418,979
TOOTHBRUSH
Robert Moskovich, East Brunswick, N.J., and Walter Vonarburg, Triengen, Switzerland, assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 13, 1997, Appl. No. 79,393
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104

418,980
TOOTHBRUSH
Robert Moskovich, East Brunswick, N.J.; Walter Vonarburg, Triengen, Switzerland, and Kenneth Gerald Waguespack, North Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 13, 1997, Appl. No. 79,397
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104

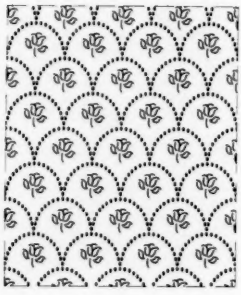
418,981
TOOTHBRUSH
Chow Koh Cheong, and Yuet Peng Cheong, both of Kawasan Perusahaan Ceras Jaya, Malaysia, assignors to Sinorita Sendirian Berhad, Selangor, Malaysia
Filed Mar. 20, 1998, Appl. No. 85,303
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104



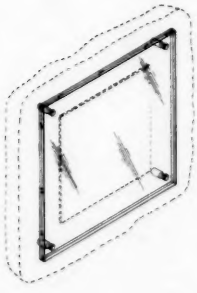
418,982
TOOTHBRUSH
Walter Vonarburg, Triengen, Switzerland, assignor to Trisa Holding, AG, Triengen, Switzerland
Filed Oct. 26, 1998, Appl. No. 95,550
Claims priority, application WIPO, Apr. 27, 1998, DM/045033
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—104



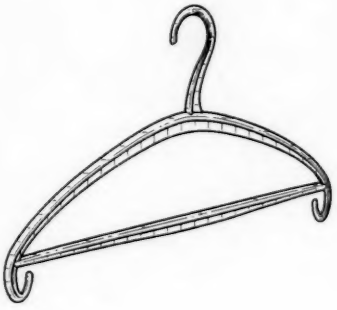
418,983
PATTERN FOR AN EMBOSSED PAPER PRODUCT
Michael Sean Pratt, Cincinnati, Ohio; Luis Bernardo de la Rosa Perez, Mexico City, Mexico; Rebecca Ann Miller, San Francisco, Calif., and John Ernest Rice, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 4, 1999, Appl. No. 104,361
Term of patent 14 years
LOC (6) Cl. 05 - *06*
U.S. Cl. D5—53



418,984
PICTURE FRAME
James Christopher Koconis, 342 E. Ward St., Milwaukee, Wis. 53207
Filed Sep. 17, 1998, Appl. No. 93,698
Term of patent 14 years
LOC (6) Cl. 06 - *07*
U.S. Cl. D6—314



418,985
COAT HANGER
Alphons Van Rhienen, Schoten, Belgium, assignor to Euro United Corporation, Oakville, Canada
Filed Apr. 2, 1999, Appl. No. 102,902
Claims priority, application Canada, Feb. 16, 1999, 1999-0419
Term of patent 14 years
LOC (6) Cl. 06 - *08*
U.S. Cl. D6—319



418,986
CHAIR
Pasquale Natuzzi, and Raffaella Lucarelli, both of Bari, Italy, assignors to Industrie Natuzzi, SPA, Bari, Italy
Filed Mar. 22, 1999, Appl. No. 102,324
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—334

418,987

MULTIFUNCTIONAL FURNITURE

Verner Panton, Kohlenberggasse 21, CH-4051 Basel, Switzerland

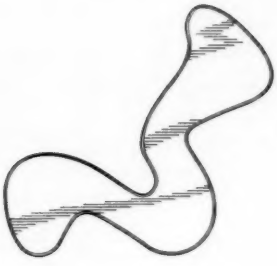
Filed Jun. 5, 1998, Appl. No. 89,013

Claims priority, application WIPO, Dec. 11, 1997, 003948

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—335



418,988

DESIGN FOR A TABLE

Jerry L. Shilling, Syracuse; Michael R. Shilling, Pierceton, and David A. Reichard, Warsaw, all of Ind., assignors to Wabash Valley Manufacturing, Inc., Silver Lake, Ind.

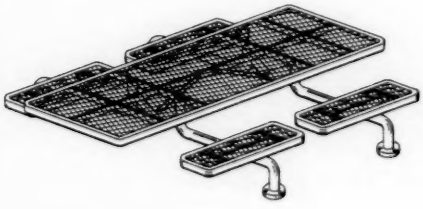
Filed Aug. 25, 1998, Appl. No. 92,714

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—337



418,989

TABLE

Jerry L. Shilling, Syracuse; Michael R. Schilling, Pierceton, and David A. Reichard, Warsaw, all of Ind., assignors to Wabash Valley Manufacturing, Inc., Silver Lake, Ind.

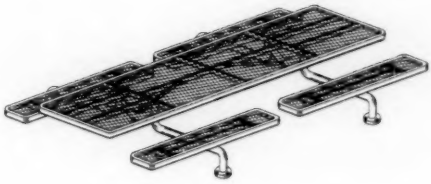
Filed Aug. 25, 1998, Appl. No. 92,716

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—337



418,990

MASSAGE CHAIR

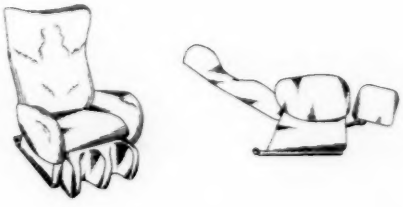
Shinichi Oguri, and Mituaki Fujishiro, both of Osaka, Japan, assignors to Kabushiki Kaisha Fuji Iryoki, Osaka-fu, Japan

Filed Nov. 13, 1998, Appl. No. 96,438

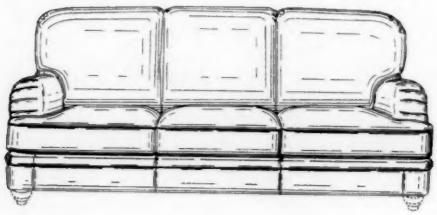
Term of patent 14 years

LOC (6) Cl. 06 - *01*

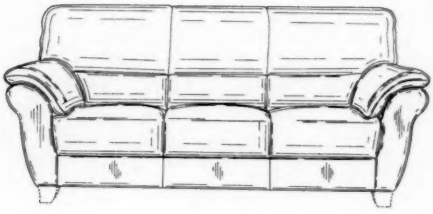
U.S. Cl. D6—367



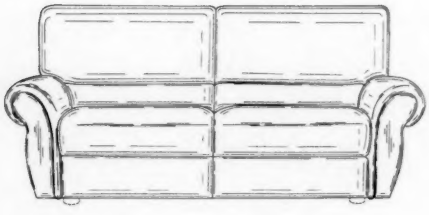
418,991
SEAT
Pasquale Natuzzi, and Domenico Abbruzzese, both of Bari, Italy, assignors to Industrie Natuzzi,Spa, Bari, Italy
Filed Oct. 15, 1998, Appl. No. 95,123
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



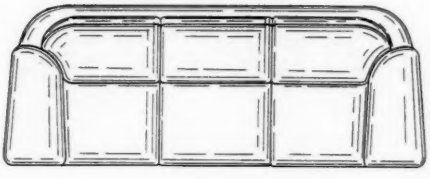
418,993
SEAT
Pasquale Natuzzi, and Domenico Abbruzzese, both of Bari, Italy, assignors to Industrie Natuzzi, SPA, Bari, Italy
Filed Mar. 19, 1999, Appl. No. 102,258
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



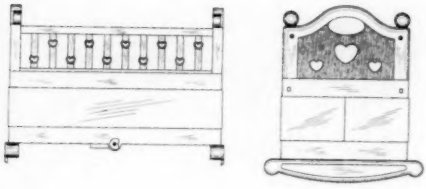
418,992
SEAT
Pasquale Natuzzi, and Domenico Abbruzzese, both of Bari, Italy, assignors to Industrie Natuzzi, SPA, Bari, Italy
Filed Mar. 19, 1999, Appl. No. 102,204
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



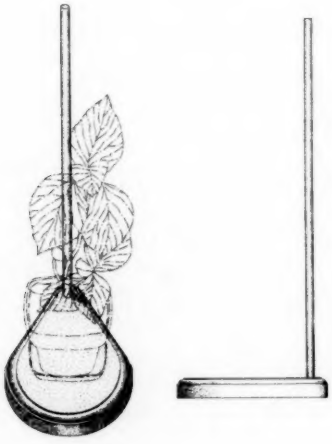
418,994
SEAT
Pasquale Natuzzi, and Domenico Abbruzzese, both of Bari, Italy, assignors to Industrie Natuzzi, SPA, Bari, Italy
Filed Mar. 2, 1999, Appl. No. 102,286
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



418,995
CRIB
Martin Blumenthal, 499 Long View Ave., Chatham, N.J. 07928
Filed Apr. 27, 1999, Appl. No. 104,067
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—385

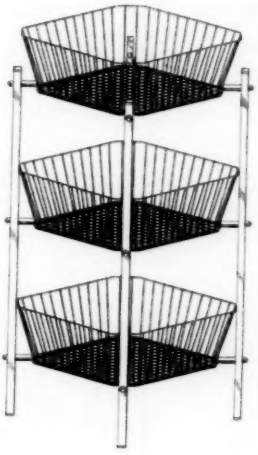


418,996
PLANT SUPPORT STAND
Jack D. Burner, 1006 Hillview Dr., Lemont, Ill. 60439-4336
Filed Oct. 29, 1998, Appl. No. 95,750
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—403



418,997
ADJUSTABLE TABLE
Steven Leveen, Delray Beach; Deborah Base, Boynton Beach, and Denise Tedaldi, Jupiter, all of Fla., assignors to Levenger Company, Delray Beach, Fla.
Filed Dec. 4, 1998, Appl. No. 97,376
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—429

418,998
RACK
Marvin Glassenberg, 6857 N. Francisco, Chicago, Ill. 60645
Filed Dec. 14, 1998, Appl. No. 97,807
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—458



418,999

DESK

Chuen-Jong Tseng, Chiayi Hsien, Taiwan, assignor to Shin Yen Enterprise Co., Ltd., Chiayi Hsien, Taiwan

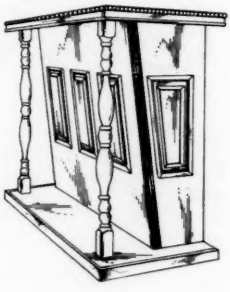
Filed Jun. 2, 1999, Appl. No. 105,780
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—480

419,000

PORTABLE BEVERAGE BAR

Austra L. Galloway, 2219 Glynn Arven Ct., Augusta, Ga. 30906

Filed Nov. 13, 1998, Appl. No. 96,519
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—481

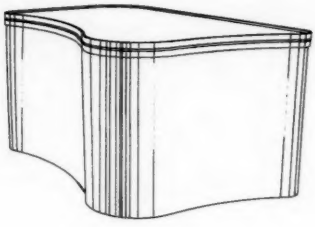


419,001

END TABLE

Earl S. Swensson, Franklin, and David S. Gilbert, Hermitage, both of Tenn., assignors to Wellness, LLC, Nashville, Tenn.

Filed Mar. 11, 1999, Appl. No. 101,806
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—486

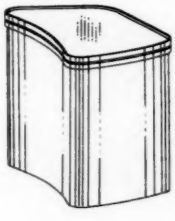


419,002

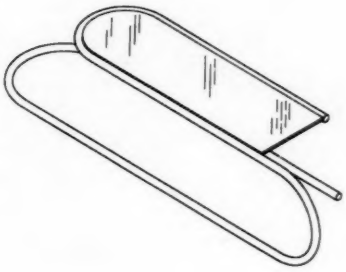
END TABLE

Earl S. Swensson, Franklin, and David S. Gilbert, Hermitage, both of Tenn., assignors to Wellness, LLC, Nashville, Tenn.

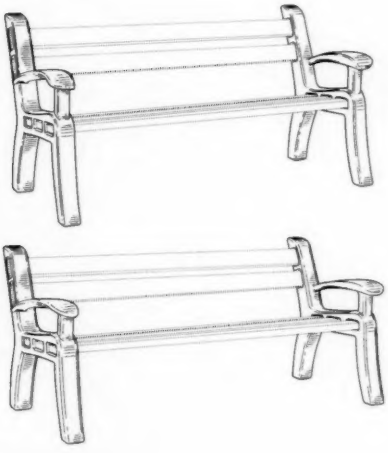
Filed Mar. 11, 1999, Appl. No. 101,807
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—486



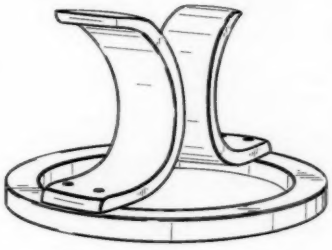
419,003
TABLE
Nicholas B. Foussianes, 3150 N. Lake Shore Dr., Unit 26C, Chicago, Ill. 60657
Filed Nov. 3, 1998, Appl. No. 95,980
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—487



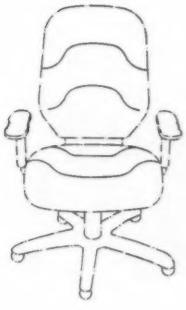
419,004
GARDEN BENCH
Michael T. Collins, Brigham City, Utah, assignor to Lifetime Products, Inc., Clearfield, Utah
Filed Dec. 18, 1998, Appl. No. 98,052
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—492



419,005
CHAIR/OTTOMAN BASE
Ronald D. McDiarmid, La Habra, Calif., assignor to Gruga U.S.A., City of Industry, Calif.
Filed Jul. 6, 1998, Appl. No. 90,318
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—495



419,006
SURFACE TREATMENT FOR A CHAIR
Jonathan Ginat, New York, N.Y., assignor to Global Upholstery Company, Ontario, Canada
Division of application No. 29/085,947, Apr. 2, 1998. This application Jan. 29, 1999, Appl. No. 99,913.
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—500



419,007

BACK FOR A CHAIR

Zooey Chu, Grand Rapids, Mich., assignor to Teknion Furniture Systems Inc., Downsview, Canada

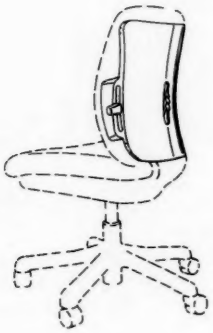
Filed May 11, 1998, Appl. No. 87,816

Claims priority, application Canada, Mar. 31, 1998, 1998/0778

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—502



419,008

RESTAURANT BOOTH BACKING

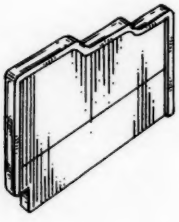
Christos Livieratos, 2822 W. Ainslie, Chicago, Ill. 60625

Filed Sep. 24, 1998, Appl. No. 94,035

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—502



419,009

DISPENSING TOWER INCLUDING A DETACHABLE MERCHANDISER

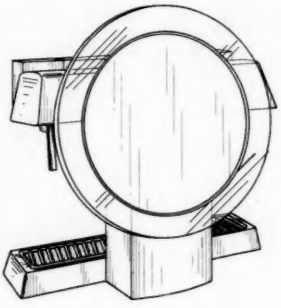
Nicholas Mohat, San Antonio, Tex., assignor to Lancer Partnership, Ltd., San Antonio, Tex.

Filed Aug. 18, 1998, Appl. No. 92,406

Term of patent 14 years

LOC (6) Cl. 06 - *02*

U.S. Cl. D6—515



419,010

BAG DISPENSER

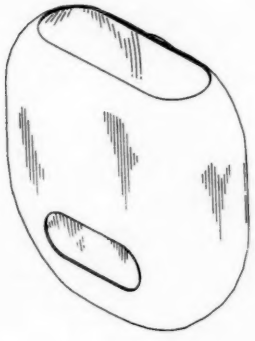
Brad Hansen, 3675 Golden Orchard Drive, Mississauga, Ontario, Canada, L4Y 3J2, and Alan L. Zupo, 7805 Bayview Avenue, Suite 310, Thornhill, Ontario, Canada, L3T 7N1

Filed Nov. 27, 1998, Appl. No. 97,098

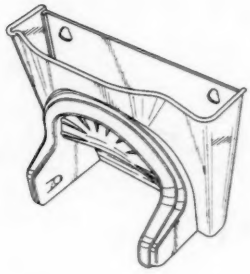
Term of patent 14 years

LOC (6) Cl. 07 - *07*

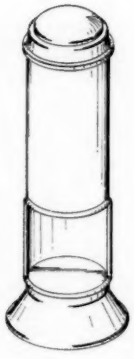
U.S. Cl. D6—515



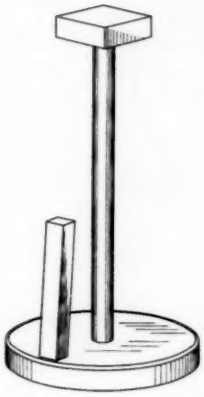
419,011
COMBINED TOILET TISSUE HOLDER/STORAGE DEVICE
Benjamin E. Gilmore, Redondo Beach, Calif., assignor to Perrin Manufacturing Company, City of Industry, Calif.
Filed Dec. 24, 1998, Appl. No. 98,278
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—519



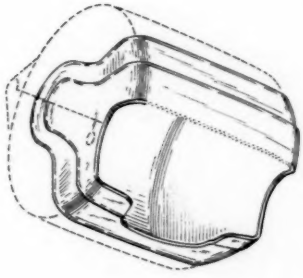
419,012
ILLUMINATED TOILET PAPER HOLDER
Leroy Wiggins, Jr., Buffalo, N.Y., assignor to WiggCo Designs LLC, Buffalo, N.Y.
Filed May 3, 1999, Appl. No. 104,287
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—520



419,013
PAPER TOWEL HOLDER
David W. Tisdale, Southport, Conn., assignor to M. Kamenstein, Inc., Elmsford, N.Y.
Filed Jun. 1, 1998, Appl. No. 88,778
Term of patent 14 years
LOC (6) Cl. 06 - *02*
U.S. Cl. D6—522



419,014
PAPER TOWEL DISPENSER
Craig A. Fluegge, Milwaukee, and Brian Hubanks, Dousman, both of Wis., assignors to San Jamar, Inc., Elkhorn, Wis.
Filed Dec. 11, 1998, Appl. No. 97,725
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—522



419,015

PORTABLE PAPER TOWEL DISPENSER

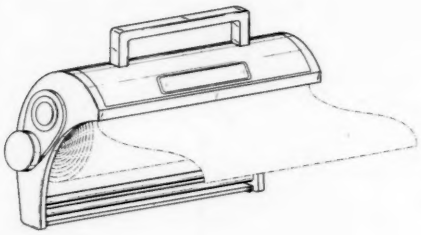
Tom Umemoto, 1668 255th St., Harbor City, Calif. 90710

Filed May 12, 1999, Appl. No. 104,782

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—522



419,016

BATHROOM TISSUE DISPENSER

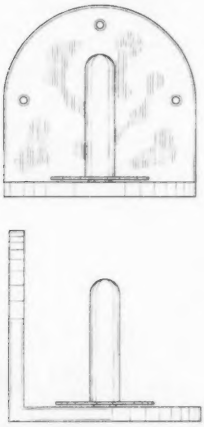
Robert L Twitty, 3611 Wolfes Rd., Monroe, N.C. 28110

Filed Apr. 9, 1998, Appl. No. 86,307

Term of patent 14 years

LOC (6) Cl. 06 - *02*

U.S. Cl. D6—523



419,017

TOILET PAPER DISPENSER

Veit Mahlmann, Hamburg, Germany, assignor to HEWI Heinrich Wilke GmbH, Arolsen, Germany

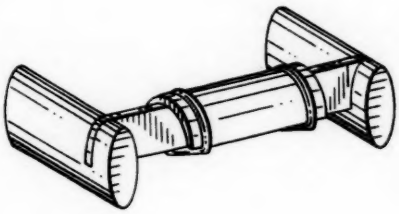
Division of application No. 29/076,533, Sep. 12, 1997, Pat. No. Des. 405,997. This application Feb. 19, 1999, Appl. No. 100,794.

Claims priority, application Germany, Mar. 13, 1997, M 97 02 486

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—523



419,018

TOOTHBRUSH HOLDER

Roger Henry Jeynes, Birmingham, United Kingdom, assignor to Samuel Heath & Sons PLC, Birmingham, United Kingdom

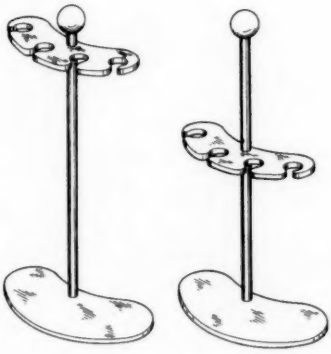
Filed Jan. 21, 1999, Appl. No. 99,573

Claims priority, application United Kingdom, Jul. 24, 1998, 2076310

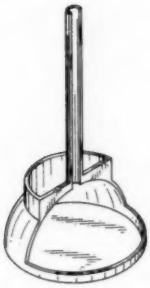
Term of patent 14 years

LOC (6) Cl. 07 - *07*

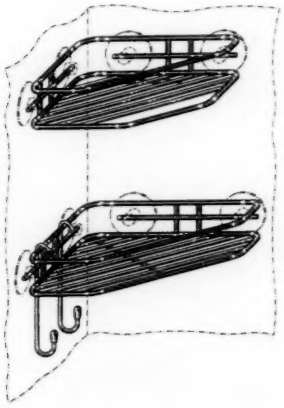
U.S. Cl. D6—534



419,019
TOILET PLUNGER AND BRUSH HOLDER
Aasef M. Shafik, 5408 Carlin Spring Rd., Arlington, Va. 22203
Filed Dec. 14, 1998, Appl. No. 97,773
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—551

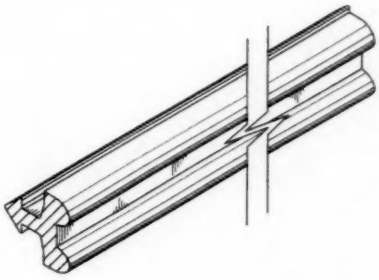


419,020
CURVED CORNER CADDY SET
William W. Emery, 326 Timber Dr., Berkeley Heights, N.J. 07922, and Russell A. Fritts, 17 Lenape Trail, Warren, N.J. 07059
Filed Aug. 3, 1998, Appl. No. 91,601
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D6—562



419,021
PATIO RAIL SHELF
Wren M Owens, 1425 N. Sierra Bonita Ave. #414, Los Angeles, Calif. 90046
Filed Sep. 17, 1998, Appl. No. 93,761
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D6—574

419,022
WINDOW VALANCE TRIM ELEMENT
Mario Cadorette, Saint Therese, Canada, assignor to All-Teck Blinds P.T.B. Inc., Quebec, Canada
Filed Sep. 18, 1998, Appl. No. 93,793
Claims priority, application Canada, May 5, 1998, 1998-1160
Term of patent 14 years
LOC (6) Cl. 06 - *10*
U.S. Cl. D6—580



419,023

PILLOW SET

Kjell Ake Hagström, Växjö, Sweden, assignor to Numéra Idéutveckling AB, Växjö, and Vitech Sterling of Sweden AB, Stockholm, both of Sweden

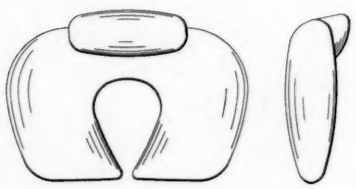
Filed Dec. 8, 1998, Appl. No. 97,516
Claims priority, application Sweden, Jun. 8, 1998, 98-1243
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601

419,024

NECK CUSHION

William R. Lenahan, Wilton; Glenn Bell, Milford, both of Conn., and Joseph Granata, West Warwick, R.I., assignors to Franzus Company, Inc., Beacon Falls, Conn.

Filed Jan. 8, 1999, Appl. No. 98,894
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601

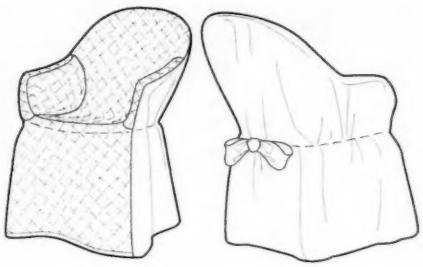


419,025

ORNAMENTAL DESIGN FOR A FURNITURE COVER

Nafiseh Lindberg, 2671 Marshall Dr., Palo Alto, Calif. 94303

Filed Dec. 24, 1998, Appl. No. 98,253
Term of patent 14 years
LOC (6) Cl. 06 - *13*
U.S. Cl. D6—611

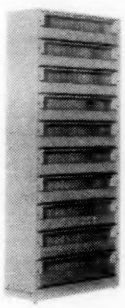


419,026

COMPACT DISC CABINET

Hiromasa Hori, Aichi; Hiroyuki Furusawa, Gifu, and Nobuhisa Naruse, Nagoya, all of Japan, assignors to Elmo Co., Ltd., Aichi, Japan

Filed Sep. 22, 1998, Appl. No. 93,985
Claims priority, application Japan, Mar. 23, 1998, D10-8209
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—630

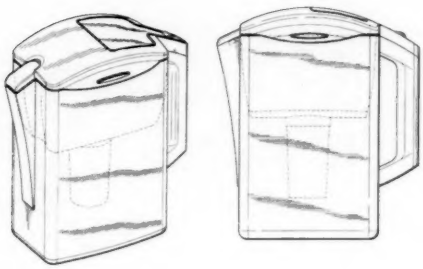


419,027

PITCHER

Deborah E. Haslem, Redwood City, Calif.; Alan D. Ball, Summerville, and Charles W. Sears, Boxford, both of Mass., assignors to The Clorox Company, Oakland, Calif.

Filed Apr. 20, 1999, Appl. No. 103,692
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—319



419,028

THERMAL CARAFE

Steve O. Mork, Lowell, Mich.; Thomas G. Volk, Germantown, and Allen C. Eimerman, Fond du Lac, both of Wis., assignors to Amway Corporation, Ada, Mich.

Filed Dec. 4, 1998, Appl. No. 97,351
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—321

419,029

SOFT SPOUT FOR CUP

Ross Steven Randolph, Rockaway, N.J., assignor to Playtex Products, Inc., Westport, Conn.

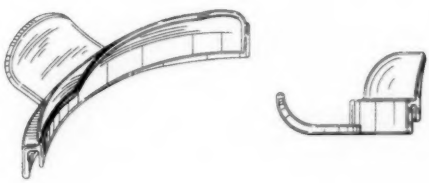
Filed Feb. 26, 1998, Appl. No. 84,202
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—392

419,030

ACCESSORY HANDLE FOR BOWL

Anita Suk Ping Liu, Orlando, Fla., assignor to Dart Industries Inc., Orlando, Fla.

Filed Dec. 10, 1998, Appl. No. 97,608
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—393



419,031

LONG HANDLE FOR COOKING VESSEL

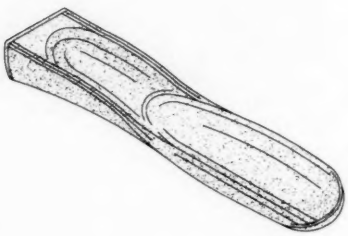
Jean-Pierre F. M. Geelen, Hasselt, and Robert H. C. M. Daenen, Herne, both of Belgium, assignors to Dart Industries Inc., Orlando, Fla.

Filed Nov. 6, 1998, Appl. No. 96,233

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—395



419,032

PERSONAL COMPUTER DRINKING VESSEL AND HOLDER

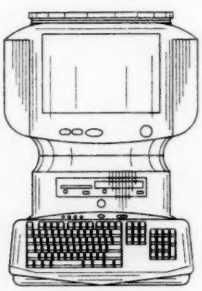
Gary M. Stern, 16650 Van Gogh Rd., Loxahatchee, Fla. 33470; Charles B. Williams, Jr., 110 Alamedia Ct., Apt. 130, Tampa, Fla. 33609, and Donald R. Lutchman, 7520 SW. 14th St., Plantation, Fla. 33317

Filed Mar. 11, 1999, Appl. No. 101,756

Term of patent 14 years

LOC (6) Cl. 07 - *01*

U.S. Cl. D7—515



419,033

BREAD STORAGE CONTAINER

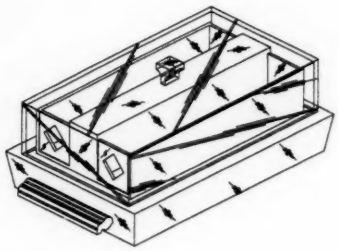
Lavon Thomas, 2239 Toledano St., New Orleans, La. 70115

Filed Feb. 23, 1998, Appl. No. 84,070

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D7—609



419,034

BANANA HANGER

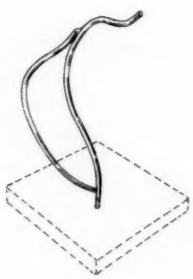
Michael O. Sturm, Granger, Iowa, assignor to Bazillion Products Corporation, Granger, Iowa

Filed Feb. 18, 1999, Appl. No. 100,824

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—628



419,035

KITCHEN KNIFE

Eric Tarrerias, Celles-sur-Durolle, France, assignor to S.E. Tarrerias-Bonjean (S. A.), Celles-sur-Durolle, France

Filed Aug. 12, 1998, Appl. No. 92,116

Claims priority, application France, Feb. 12, 1998, 981014

Term of patent 14 years

LOC (6) Cl. 07 - *03*

U.S. Cl. D7—649

419,036

COLANDER

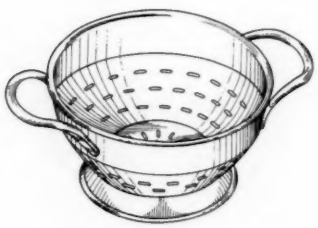
Jackson Kwong, San Gabriel, Calif., assignor to Metro/Thebe, Inc., Gardena, Calif.

Filed Mar. 18, 1999, Appl. No. 102,116

Term of patent 14 years

LOC (6) Cl. 07 - *04*

U.S. Cl. D7—667



419,037

MEATBALL FORMING PRESS

Irene M Gardner, 16 First St. Box #426, Plainfield, Conn. 06374

Filed May 6, 1999, Appl. No. 104,601

Term of patent 14 years

LOC (6) Cl. 07 - *04*

U.S. Cl. D7—672

419,038

CONDIMENT MILL

Hans Weibel, Schüpfen, Switzerland, assignor to Zyliss Haushaltwaren AG, Lyss, Switzerland

Filed Mar. 15, 1999, Appl. No. 101,979

Claims priority, application WIPO, Dec. 22, 1998, DM/004328

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—679

419,039

ICE CREAM SCOOP

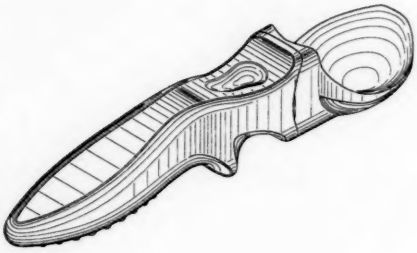
Peter Rimback, S. Euclid, Ohio, assignor to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Filed Jul. 1, 1998, Appl. No. 90,183

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—681



419,040

ICE CREAM SCOOP HANDLE

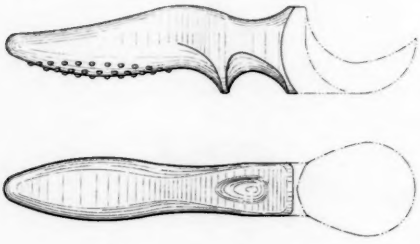
Peter Rimback, S. Euclid, Ohio, assignor to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Continuation-in-part of application No. 29/090,183, Jul. 1, 1998. This application Apr. 30, 1999, Appl. No. 104,268.

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—681



419,041

COOKWARE UTENSIL HANDLE

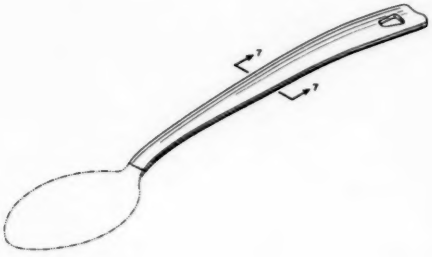
Matthew J. Frank, San Francisco, Calif., assignor to Williams-Sonoma, Inc., San Francisco, Calif.

Filed Mar. 3, 1998, Appl. No. 84,420

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—688



419,042

SHRUB TRIMMING TARP

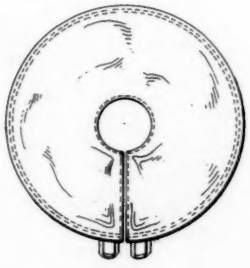
Steven D. Price, 9511 Briar Cir., Bloomington, Minn. 55437

Filed Jul. 24, 1998, Appl. No. 91,244

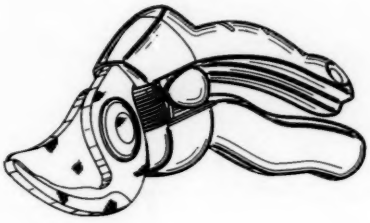
Term of patent 14 years

LOC (6) Cl. 08 - *01*

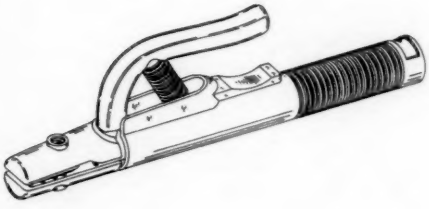
U.S. Cl. D8—1



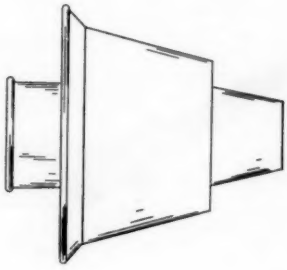
419,043
PRUNER
John Staton, Bristol, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Aug. 14, 1998, Appl. No. 92,228
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—5



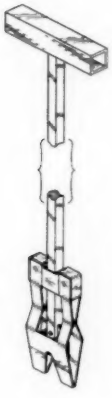
419,044
ELECTRODE HOLDER
Harish A. Amin, 644 Port Patrick Pl., Fort Mill, S.C. 29715
Filed Dec. 22, 1998, Appl. No. 98,129
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—30



419,045
SLIDING CLUTCH TOOL
Loyd Bolin, 8714 E. 43rd St., Tulsa, Okla. 74145
Filed Jul. 30, 1998, Appl. No. 91,484
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—51



419,046
AUTOMOTIVE TRIM PANEL CLIP REMOVING TOOL
Theodore K. Hunter, 501 Riverside Ave., Paso Robles, Calif. 93446
Filed Sep. 11, 1998, Appl. No. 93,516
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—51



419,047

SCISSORS

Emmanuel Jacquet, Annecy, France, assignor to Manufacture d'Articles de Precision et de Dessin M.A.P.E.D., Pringy, France

Filed Dec. 4, 1998, Appl. No. 97,368

Term of patent 14 years

LOC (6) Cl. 08 - *03*

U.S. Cl. D8—57

419,048

PNEUMATIC NAILER

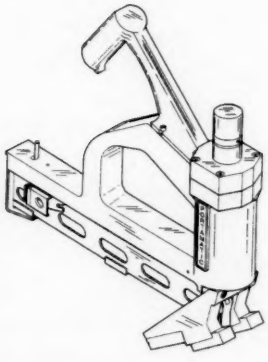
Namon B. Batts, Jr., Hampstead, and Randy M. Brown, Wilmington, both of N.C., assignors to Porta-Nails, Inc., Wilmington, N.C.

Filed Feb. 5, 1999, Appl. No. 100,135

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—68



419,049

DISPENSING JOINT KNIFE

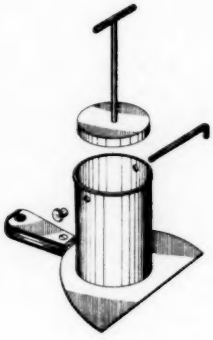
Jean C Mollack, 23 S. Poplar St., Allentown, Pa. 18102

Filed Nov. 17, 1998, Appl. No. 96,624

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—105



419,050

TOOL ASSEMBLY

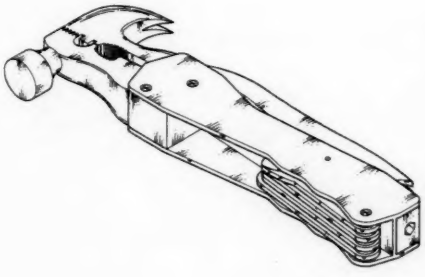
Hsing Tai Lin, P.O. Box 63-99, Taichung, Taiwan, 406

Filed May 5, 1999, Appl. No. 104,473

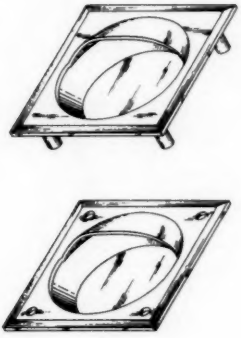
Term of patent 14 years

LOC (6) Cl. 08 - *05*

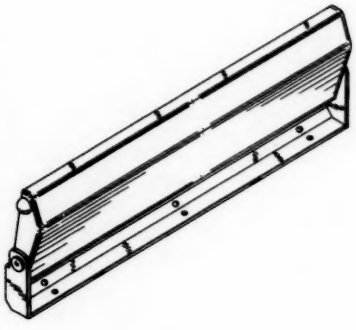
U.S. Cl. D8—105



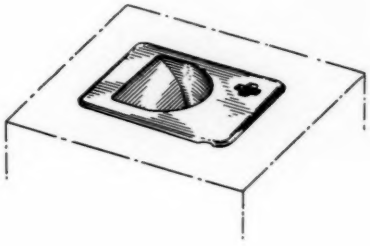
419,051
FLUSH PULL
Michael E. Heithe, Duarte, Calif., assignor to NT Quality Hardware, Brea, Calif.
Filed Sep. 20, 1995, Appl. No. 44,203
Term of patent 14 years
LOC (6) Cl. 08 - *06*
U.S. Cl. D8—313



419,052
PATIO DOOR LOCK
Louis Laporte, St-Bruno, and Jean Blouin, Montreal, both of Canada, assignors to Dudley, Inc., Hemmingford, Canada
Filed Jul. 7, 1998, Appl. No. 90,348
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—336



419,053
SLIDE LATCH
Richard E. Schlack, Rising Sun, Md., assignor to Southco, Inc., Concordville, Pa.
Continuation-in-part of application No. 29/064,685, Jan. 8, 1997, Pat. No. Des. 399,121. This application Jun. 23, 1997, Appl. No. 73,320.
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—339



419,054
JOINER
Christopher James Curwood, 2 College Street, Wendouree Victoria 3355, Australia
Filed Dec. 7, 1998, Appl. No. 97,466
Claims priority, application Australia, Jun. 5, 1998, 1627/98
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D8—382

419,055

COUPLING DEVICE FOR CONSTRUCTION MATERIAL

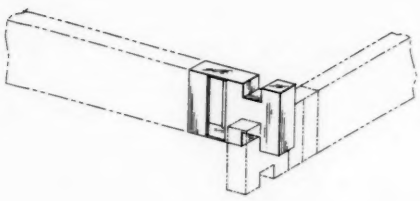
Robert J. Monson, 1027 Brenner Ave., St. Paul, Minn. 55113

Filed Jun. 9, 1999, Appl. No. 106,219

Term of patent 14 years

LOC (6) Cl. 08 - *08*

U.S. Cl. D8—382



419,056

LOCKING SPRING FOR A CONNECTOR

Lena Charlott Brorsson, Lund; Jan Gustav Atterklint, Skärholmen; Sven Ingvar Sjöqvist, Tullinge, all of Sweden; Jacobus Nicolaas Tuin, Best, Netherlands, and Carl-Magnus Hansson, Lund, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

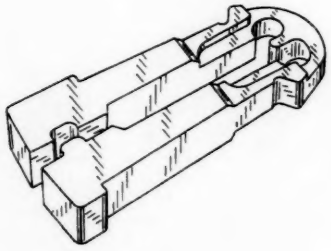
Division of application No. 29/060,693, Oct. 4, 1996, Pat. No. Des. 406,231. This application Dec. 9, 1998, Appl. No. 97,536.

Claims priority, application Sweden, Apr. 4, 1996, 96-0772

Term of patent 14 years

LOC (6) Cl. 08 - *99*

U.S. Cl. D8—499



419,057

TUBE

Marc Gobe, New York, N.Y., assignor to Gryphon Development, New York, N.Y.

Filed Sep. 4, 1998, Appl. No. 93,142

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—302

419,058

UPPER PORTION OF A PLASTIC BOTTLE

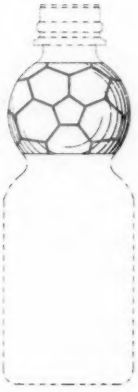
Marc W. Roth, College Park; George Conrad, Alpharetta, and Darryl J. Dawson, Decatur, all of Ga., assignors to Ball Corporation, Broomfield, Colo.

Division of application No. 09/049,582, Mar. 27, 1998. This application May 21, 1999, Appl. No. 105,299.

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—307

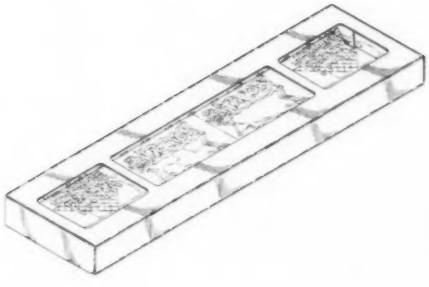


419,059
BOTTLE
Roland Charriez, Cortlandt Manor, N.Y.; Keith C. Kristiansen, Stratford, Conn.; Thomas C. Van Dyk, Ramsey, and Loreen D. Williamson, Rahway, both of N.J., assignors to Schering-Plough Healthcare Products, Inc., Memphis, Tenn.
Filed Nov. 20, 1998, Appl. No. 96,823
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—314

419,060
FINGERNAIL POLISH BOTTLE
Len Indelicato, 18080 Boris Ave., Encino, Calif. 91436, and George H. Carroll, 3033 Grove Ave., Ventura, Calif. 93003
Continuation-in-part of application No. 29/090,347, Jul. 7, 1998, Pat. No. Des. 401,141. This application Sep. 3, 1998, Appl. No. 93,102.
Term of patent 14 years
LOC (6) Cl. 09 - *05*
U.S. Cl. D9—317

419,061
BOTTLE
Robert Croft, Jersey City; James Warner, Hoboken, both of N.J.; Robert Boyce, Strafford, Pa., and Neil Enciso, Buffalo Grove, Ill., assignors to McNeil-PPC, Inc., Skillman, N.J.
Filed Mar. 19, 1999, Appl. No. 102,262
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—333

419,062
CARTON FOR MULTIPLE INDIVIDUALLY PACKAGED PRODUCTS
Daniel R. Feldmeier, Mt. Horeb, and Carolyn Abbott, Waunakee, both of Wis., assignors to Kraft Foods, Inc., Madison, Wis.
Filed Mar. 3, 1998, Appl. No. 84,431
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—346



419,063

TOOTHBRUSH PACKAGE

Bradley William Baker, Pleasanton, Calif.; Joseph Michael Kornick, and Jose Tirso Olivares, both of Chicago, Ill., assignors to Gillette Canada Inc., Kirkland, Canada

Filed Oct. 21, 1998, Appl. No. 95,360

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—415

419,064

PACKAGING

Sylvain Gorry, Montreal, Canada, assignor to Priva Inc., Anjou, Canada

Filed Jan. 25, 1999, Appl. No. 99,602

Claims priority, application Canada, Dec. 21, 1998, 1998-3107

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—415

419,065

PACKAGE

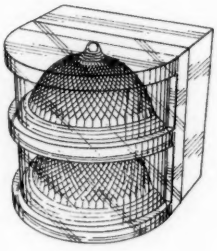
Neall W. Humphrey, El Dorado Hills, Calif., assignor to Trade Source International, El Dorado Hills, Calif.

Filed Aug. 27, 1998, Appl. No. 92,784

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—418



419,066

LOCKING BOX WITH TEXTURED SURFACE

Robert Lentini, Pensacola, Fla., assignor to Daws Manufacturing Co., Inc., Pensacola, Fla.

Filed May 13, 1998, Appl. No. 87,992

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—423

419,067

FOOD BOX

Francois Guillin, Mouthier Haute Pierre, France, assignor to Groupe Guillin (Societe Anonyme), Ornans, France

Division of application No. 29/075,242, Aug. 27, 1997, Pat. No. Des. 409,911. This application Feb. 24, 1999, Appl. No. 101,129.

Claims priority, application France, Mar. 5, 1997, DM/039 433

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—430

419,068

FLUID DROPPER WITH CAP

Phillip E. Mark, 6417 Marlberry Dr., Orlando, Fla. 32819

Filed Oct. 1, 1998, Appl. No. 94,399

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—436

419,069

CLOSURE FOR DISPENSING NOZZLE

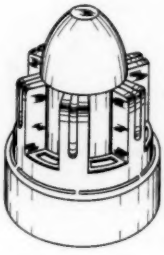
James M. Beck, Long Grove; Thomas C. Stoneberg, Buffalo Grove; Gary Berge, Crystal Lake; Terry Kubitz, Cary, all of Ill., and Thomas Tedeschi, Jr., Brewster, N.Y., assignors to Kraft Foods Inc., Northfield, and Creative Packaging Corp., Buffalo Grove, both of Ill.

Filed May 12, 1999, Appl. No. 104,779

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—443



419,070

PUSH-PULL CLOSURE

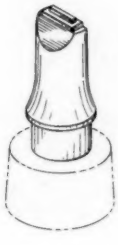
Heiner J. Schuermann, Greenville, S.C., assignor to Alltrista Corporation, Indianapolis, Ind.

Filed Aug. 10, 1998, Appl. No. 91,977

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—449



419,071

CAP FOR PRESSURIZED DRINK BOTTLES

André François Peters, Haarlem, and Victor Alexander De Vries, Overveen, both of Netherlands, assignors to Sparkle Systems S.A., Luxembourg, Luxembourg

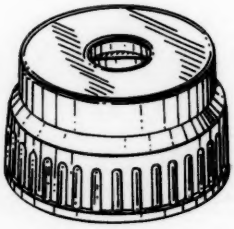
Filed Aug. 28, 1997, Appl. No. 76,042

Claims priority, application Hague Agreement, Mar. 4, 1997, DM/039425

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—453



419,072

COMBINED PERFUME BOTTLE AND STAND

Chahed Khaled, 26 Avenue Trudaine, 75009 Paris, France

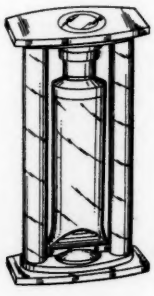
Filed Jan. 5, 1998, Appl. No. 81,499

Claims priority, application WIPO, Jul. 10, 1997, DM041882

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—517



419,073

COMBINED BOTTLE AND CAP

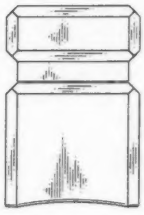
Christian Jauffret, LaVallois Perret, France, assignor to Elizabeth Arden Co., New York, N.Y.

Filed May 5, 1999, Appl. No. 104,437

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—520



419,074

BOTTLE

Peter Brian Clarke, Westport, Conn., assignor to Playtex Products, Inc., Nyala Farms, Conn.

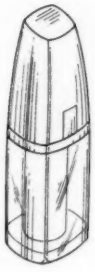
Filed Jun. 17, 1999, Appl. No. 106,551

Term of patent 14 years

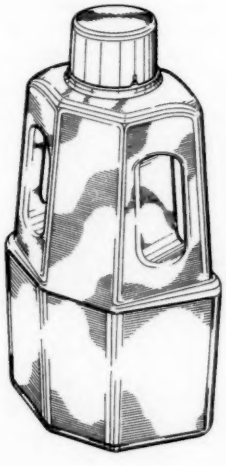
LOC (6) Cl. 09 - *01*

U.S. Cl. D9—523

419,075
NAIL ENAMEL CONTAINER
Ellen Gavin, Atlantic Highlands, N.J., assignor to L'Oreal S.A., Paris, France
Filed Mar. 10, 1999, Appl. No. 101,730
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—529

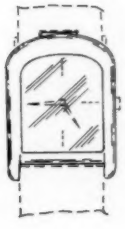


419,076
AGROCHEMICAL BOTTLE
Lawrence Clifford Dull, Greensboro, N.C., assignor to Novartis Crop Protection, Greensboro, N.C.
Filed Nov. 10, 1998, Appl. No. 96,336
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—533



419,077
CONTAINER
Tim Sultan, Fort Collins, Colo., assignor to Restore, Inc., Fort Lauderdale, Fla.
Filed Mar. 2, 1999, Appl. No. 101,366
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—563

419,078
WATCH
Eric Bonnett, Neuchatel, Switzerland, assignor to Sara Lee Corporation, Winston Salem, N.C.
Filed Feb. 12, 1999, Appl. No. 100,533
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30

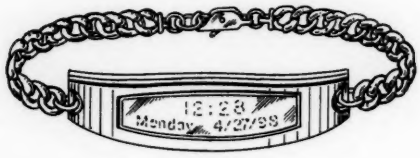


419,079

WATCH BRACELET

Sandra L. Rodkey, 11826 N. College Lot 208, Kansas City, Mo. 64156

Filed Feb. 26, 1999, Appl. No. 101,192
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—31

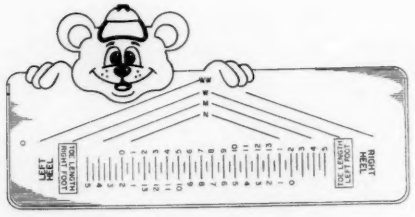


419,080

CHILDREN'S HOME SHOE SIZER

Ernest John Panek, 517 Shady Ridge Dr., Monroeville, Pa. 15146

Filed Jan. 8, 1999, Appl. No. 98,907
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—70

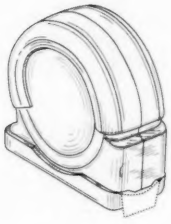


419,081

TAPE MEASURE

John Joseph Evans, Jr., Charleston; Roger Dennis Thibodeau, North Charleston, both of S.C.; Wayne Patrick Phillips, Hudson, Wis., and Jerome Allan Grunstad, Inver Grove Heights, Minn., assignors to The L. S. Starrett Company, Athol, Mass.

Filed Mar. 30, 1999, Appl. No. 102,702
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—72

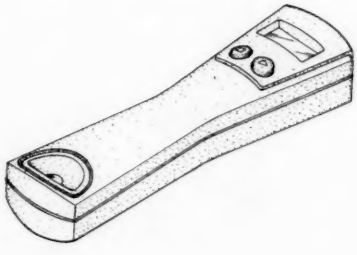


419,082

REFRACTOMETRIC ANALYZER

Martin Wensley, Alameda, and Jeffrey Dickert, Pleasanton, both of Calif., assignors to Techniquip, Livermore, Calif.

Filed Jan. 21, 1999, Appl. No. 99,428
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—78

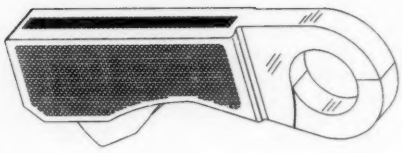


419,083

CURRENT PROBE

Matt H. Shafie, Casselberry, Fla., assignor to Bell Technologies Inc., Orlando, Fla.

Filed Dec. 9, 1998, Appl. No. 97,561
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—79

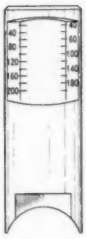


419,084

GAUGE

John R. Boehringer, Wynnewood; John Karpowicz, Chester Springs, and Michael I. Hegedus, Royersford, all of Pa., assignors to Boehringer Laboratories, Inc., Norristown, Pa.

Filed Sep. 2, 1998, Appl. No. 93,064
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—85

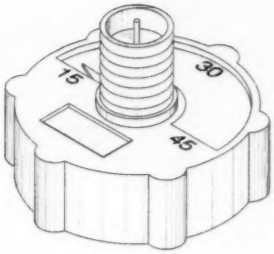


419,085

TIRE VALVE STEM PRESSURE GAUGE

Robert S Prus, 2630 Vermillion Rd., Seabrook, Tex. 77586

Filed Nov. 25, 1998, Appl. No. 97,045
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—86

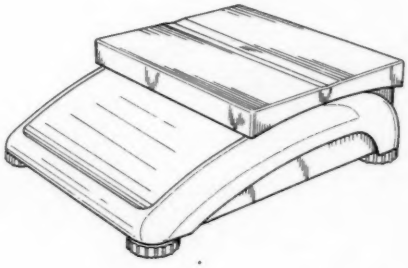


419,086

COMPACT BALANCE

Jürgen R. Schmid, Ammerbuch, Germany, assignor to Mettler-Toledo GmbH, Greifensee, Switzerland

Filed Jan. 26, 1999, Appl. No. 99,678
Claims priority, application Hague Agreement, Aug. 12, 1998, 124013401
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—91



419,087

SCALE DISPLAY

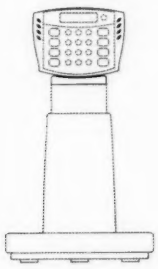
Gregory J. Arnold, Saint Johnsbury; Michael P. Conner, Danville; James S. Havers, Saint Johnsbury, all of Vt.; Ben H. Graves, Stilwell, Kans.; David K. Crabbe, West Millbury, Mass.; David C. Elms, Marlboro, Mass., and Bonnie L. Crabbe, West Millbury, Mass., assignors to Fairbanks Scales, Kansas City, Mo.

Filed Dec. 31, 1998, Appl. No. 98,578

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—94



419,088

CORIOLIS FLOWMETER HOUSING

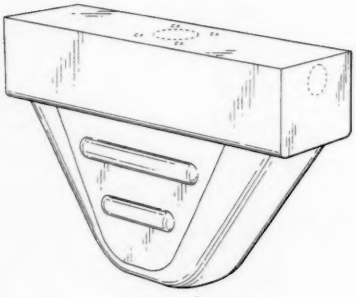
Nicholas Waddell Oakley, San Francisco, Calif., assignor to Micro Motion, Inc., Boulder, Colo.

Filed Mar. 19, 1999, Appl. No. 102,208

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—96



419,089

BODY FAT MONITOR

Takanobu Yamauchi; Nobuo Kubo, and Miharu Kon, all of Kyoto, Japan, assignors to OMRON Corporation, Kyoto, Japan

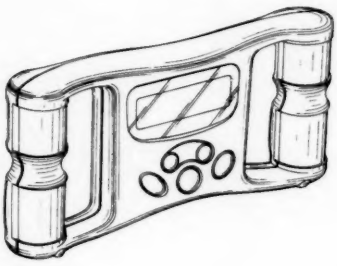
Filed Nov. 16, 1998, Appl. No. 96,606

Claims priority, application Japan, May 18, 1998, 10-14010

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—97



419,090

RAIN GAUGE

Stephen M. Folos, Elmhurst, Ill., and Douglas J. Walby, Janesville, Wis., assignors to Chaney Instrument Co., Lake Geneva, Ill.

Filed Sep. 3, 1998, Appl. No. 94,740

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—101

419,091

LIQUID LEVEL SENDER ASSEMBLY

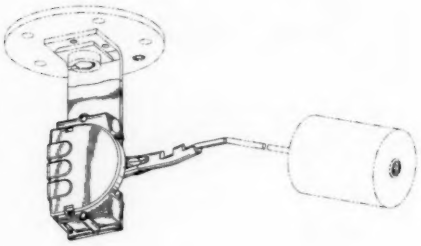
Will Pattison, Austin, and Jeffrey A. Reed, Cedar Park, both of Tex., assignors to Rochester Gauges, Inc., Dallas, Tex.

Filed Apr. 1, 1999, Appl. No. 102,809

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—101



419,092

TRAILER HITCH ALIGNMENT MONITOR

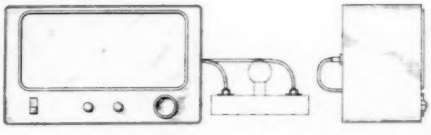
Lynn D Gildersleeve, 10031 Linda La., Des Plaines, Ill. 60016

Filed May 6, 1999, Appl. No. 104,612

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—104



419,093

FIRE ALARM CONTROL PANEL DOOR

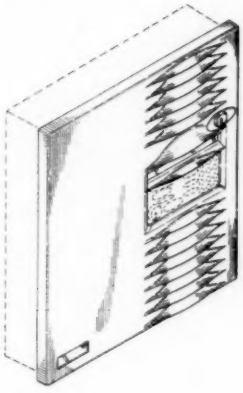
George Reekie, 183 Federal St., Salem, Mass. 01970, and David Petersen, 83 Groton Rd., Ayer, Mass. 01432

Filed Feb. 17, 1999, Appl. No. 100,753

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—106



419,094

COMBINED ALARM AND ILLUMINATOR FOR INFRARED DETECTORS

Wen-Hsiang Chang, No. 1, Alley 36, Lane 121, Te-Lin Rd., Lung-Tan Hsiang, T'ao-Yuan Hsien, Taiwan

Filed Apr. 15, 1999, Appl. No. 103,533

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—106

419,095

BEZELLED LIGHT DISPLAY FOR A LIGHT EMITTING DIODES

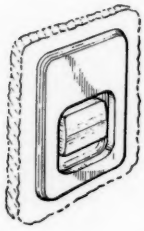
James E. Holmes, Riverton, Utah, assignor to Harman Music Group, Incorporated, Sandy, Utah

Filed Oct. 4, 1996, Appl. No. 60,741

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—108



419,096

VEHICLE PARKING AID

Franklin R Copenhaver, 6440 Stoney Creek Dr., Huber Heights, Ohio 45424

Filed Mar. 18, 1999, Appl. No. 102,122

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—109

419,097

INDUSTRIAL EMERGENCY UNIT LIGHT FIXTURE

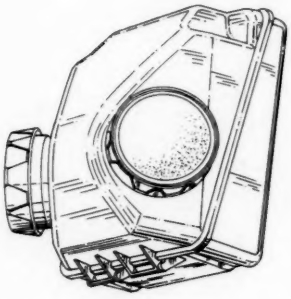
Paul Kenneth Pickard, Conyers; James Michael Lay, Cumming, and Mark C. Logan, Doraville, all of Ga., assignors to NSI Enterprises, Inc., Atlanta, Ga.

Filed Mar. 8, 1999, Appl. No. 101,635

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—114



419,098

WIND CHIMES

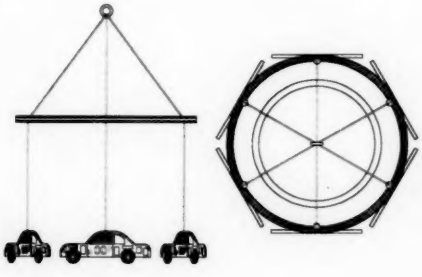
Carla Y Evans, 6711 Saufley Pines Rd., Pensacola, Fla. 32526

Filed Mar. 18, 1999, Appl. No. 102,121

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—116



419,099

CAR HORN

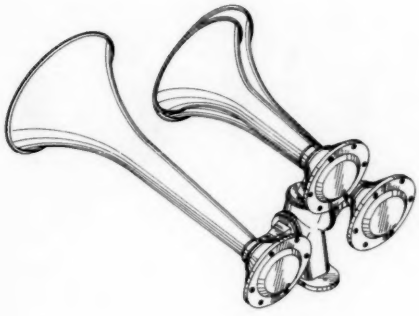
Fu-Chih Chen, Tainan Hsien, Taiwan, assignor to Fu-Chang Chen, Tainan Hsien, Taiwan

Filed Aug. 21, 1998, Appl. No. 92,535

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—120



419,100

CAMOUFLAGE MOISTURE-PROOF JACKET AFFIXED TO TURKEY CALL

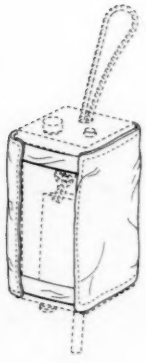
Greg Allen Abbas, 3210 W. Calhoun, Beaverton, Mich. 48612

Filed Jun. 4, 1999, Appl. No. 105,859

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—121



419,101

PROTECTOR FOR WRIST WATCH LENS OR THE LIKE

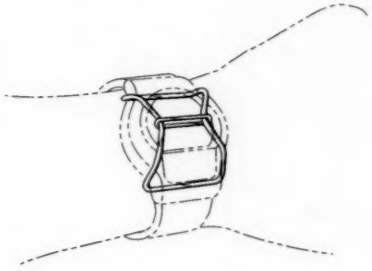
Charles E. Myers, 10624 S. Wasatch Blvd., Sandy, Utah 84092

Division of application No. 29/075,088, Aug. 12, 1997, Pat. No. Des. 410,865. This application Jan. 4, 1999, Appl. No. 98,646.

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—132



419,102

RING

Peter J. Mestrum, Nieuwegein, Netherlands, assignor to Flamingo, B.V., Nieuwegein, Netherlands

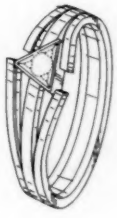
Division of application No. 29/072,101, Jun. 4, 1997. This application Feb. 25, 1999, Appl. No. 107,033.

Claims priority, application Benelux TM/Des. Off., Dec. 5, 1996, 72586-01; Dec. 5, 1996, 72586-02; Dec. 5, 1996, 72586-03

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—26



419,103

GEM CUT

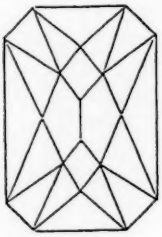
Joseph Freilich, Old Westbury, N.Y., assignor to M. Fabrikant & Sons, Ltd., New York, N.Y.

Filed Jan. 14, 1999, Appl. No. 99,130

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—90



419,104

PRECIOUS STONE

Jan Antoon Ceulemans, A. Roncallilaan 9, B-2610 Wilrijk, Belgium

Filed Apr. 26, 1999, Appl. No. 103,935

Claims priority, application Benelux TM/Des. Off., Jan. 6, 1999, 75301

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—90

419,105

SET OF BRIDE AND GROOM FIGURES FOR DECORATION

Wendy Michele Cohen, 450 W. 24th St. #6A, New York, N.Y. 10011, assignor to Wendy Michele Cohen, New York, N.Y.

Continuation of application No. 09/207,470, Dec. 8, 1998. This application Jun. 14, 1999, Appl. No. 106,370.

Term of patent 14 years

LOC (6) Cl. 11 - *05*

U.S. Cl. D11—184

419,106

BELT ADJUSTER

Ryoichiro Uehara, Kurobe, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed Oct. 20, 1998, Appl. No. 95,302

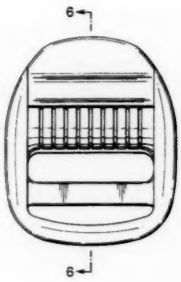
Claims priority, application Japan, Apr. 21, 1998, 10-11591

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 02 - *07*

U.S. Cl. D11—218



419,107

MULTI PASSENGER ELECTRIC VEHICLE

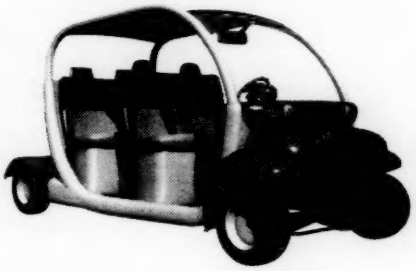
Michael J. Hofer, and Neil Doty, both of Fargo, N. Dak., assignors to Global Electric Motorcars L.L.C., Fargo, N. Dak.

Filed Aug. 6, 1998, Appl. No. 91,797

Term of patent 14 years

LOC (6) Cl. 12 - *08*

U.S. Cl. D12—86



419,108

AUTOMOBILE

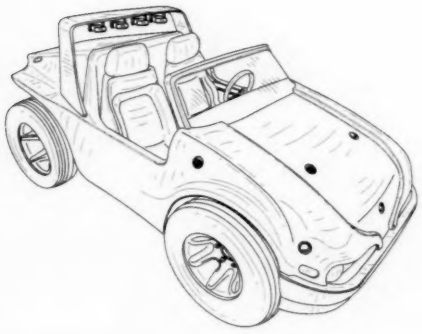
Laura N. Lombardi, Olathe, Kans., and Jeffrey T. Owens, Kansas City, Mo., assignors to PlaNet Productions, Inc., Olathe, Kans.

Filed Mar. 1, 1999, Appl. No. 101,456

Term of patent 14 years

LOC (6) Cl. 12 - *08*

U.S. Cl. D12—88



419,109

SURFACE CONFIGURATION OF A VEHICLE

Peter Gabath, Starnberg, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

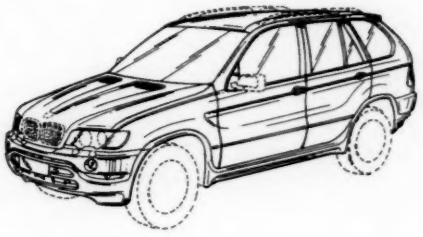
Filed Dec. 9, 1998, Appl. No. 97,521

Claims priority, application Germany, Jun. 10, 1998, M 98 05 818

Term of patent 14 years

LOC (6) Cl. 12 - *08*

U.S. Cl. D12—91



419,110

DESIGN FOR BICYCLE FRAME

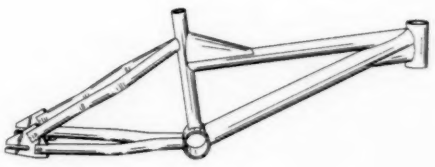
David J. Allen, Lawrenceburg; David R. Rush, Murfreesboro, and Paul T. Wallace, Lewisburg, all of Tenn., assignors to Murray, Inc., Brentwood, Tenn.

Filed May 14, 1999, Appl. No. 104,990

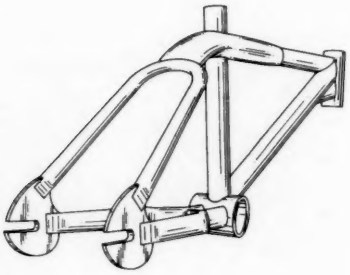
Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—111



419,111
BICYCLE FRAME
David J. Allen, Lawrenceburg; David R. Rush, Murfreesboro, and Paul T. Wallace, Lewisburg, all of Tenn., assignors to Murray, Inc., Brentwood, Tenn.
Filed May 14, 1999, Appl. No. 104,991
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—111



419,112

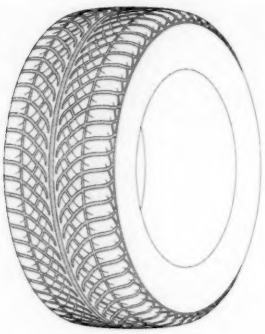
Patent Not Issued For This Number

419,113
COLLAPSIBLE BABY STROLLER FOR A JOGGER
Richard C. Everett, 225 Sunshine La., West Linn, Oreg. 97068
Filed Jun. 21, 1999, Appl. No. 106,616
Term of patent 14 years
LOC (6) Cl. 12 - *12*
U.S. Cl. D12—129

419,114
TIRE TREAD
Michael Joseph Weber, Mogadore; Darrell Edwin Covert, North Canton; Samuel Patrick Landers, Uniontown; Craig David Miller, Norton; Dale Gustav Freygang, Akron, and James Christopher Stroble, Kent, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation-in-part of application No. 29/085,748, Mar. 30, 1998, Pat. No. Des. 405,741. This application Dec. 16, 1998, Appl. No. 97,882.
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—143

419,115
TIRE TREAD
Michael Joseph Weber, Mogadore, Ohio, and Kevin Alan Reid, Asheville, N.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 16, 1998, Appl. No. 97,880
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—146

419,116
TIRE TREAD
James G. Guspodin, Akron, Ohio; Yasuo Himuro, Tachikawa, Japan; William B. Allison, Cuyahoga Falls, and David M. Reep, Copley, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Oct. 8, 1998, Appl. No. 94,707
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147

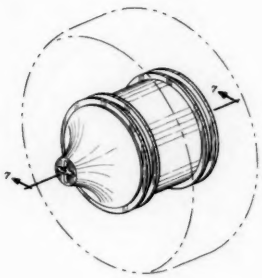


419,117
TIRE TREAD
Billy Joe Ratliff, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 6, 1999, Appl. No. 98,818
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147

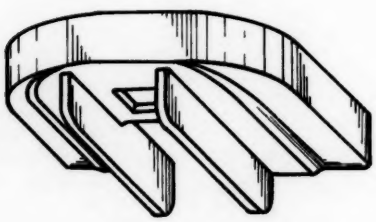
419,118
TIRE TREAD
Timothy J. Lassan, Kent; William B. Allison, Cuyahoga Falls, and Michel Beauvais, Fairlawn, all of Ohio, assignors to Bridgestone/Firestone Research, Inc., Akron, Ohio
Filed Jan. 29, 1999, Appl. No. 99,842
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147

419,119
TIRE TREAD
Herve Marcel Henri Beauguitte, Colmar-Berg, Luxembourg, and Michel Pierre Charles Robert, Sibret, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 8, 1999, Appl. No. 100,223
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147

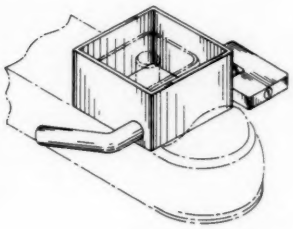
419,120
EXTENDED AXLE AND STABILIZER
Faramarz Khaladj; Steve Khalaj, and Farhad Khalaj, all of 23161 Peralta Dr., Laguna Hills, Calif. 92653
Filed Jul. 15, 1998, Appl. No. 90,727
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—160



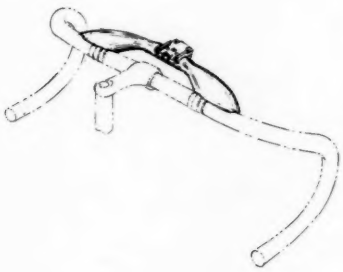
419,121
TRAILER HITCH LOCK
Robert A. Bills, 971 Wells Cir., Meridian, Id. 83642
Filed Apr. 5, 1999, Appl. No. 102,955
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—162



419,122
VEHICLE HITCH LOCK
Clyde G. Stech, Orlando, Fla., assignor to B.C. Cure, Inc., Apopka, Fla.
Filed May 4, 1999, Appl. No. 104,413
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—162



419,123
BICYCLE SPEEDOMETER BRACKET ATTACHMENT BAR
Youji Okuda, Tondabayashi, Japan, assignor to Cat Eye Co., Ltd., Japan
Filed Apr. 21, 1999, Appl. No. 103,761
Claims priority, application Japan, Nov. 6, 1998, 10-32158
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—178



419,124

SURFACE CONFIGURATION OF A SIDE DOOR PANEL FOR A VEHICLE

Bruno Sacco, Sindelfingen, and Peter Pfeiffer, Boeblingen, both of Germany, assignors to DaimlerChrysler AG, Germany

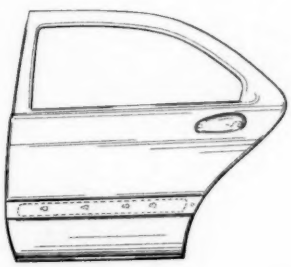
Filed Jan. 21, 1999, Appl. No. 99,421

Claims priority, application Germany, Jul. 21, 1998, 4 98 07 262

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—196



419,125

SURFACE CONFIGURATION OF A SIDE PANEL FOR A VEHICLE

Bruno Sacco, Sindelfingen, and Peter Pfeiffer, Boeblingen, both of Germany, assignors to DaimlerChrysler AG

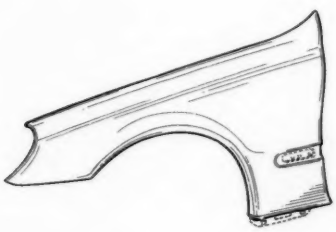
Filed Jan. 21, 1999, Appl. No. 99,446

Claims priority, application Germany, Jul. 21, 1998, 498 07 262

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—196



419,126

FRONT FACE OF A VEHICLE WHEEL

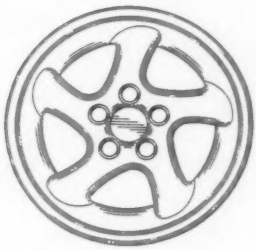
Frank R. Hartmann, Jr., 12470 NW. Hartmann Dr., Forest Grove, Oreg. 97116

Filed May 1, 1998, Appl. No. 87,428

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209



419,127

AUTOMOBILE WHEEL COVER

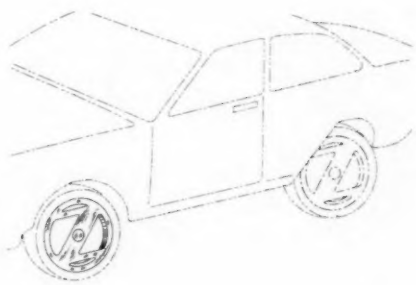
David Megugorac, 2518 Elwood Ct., Perris, Calif. 92571

Filed Feb. 10, 1999, Appl. No. 100,453

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209

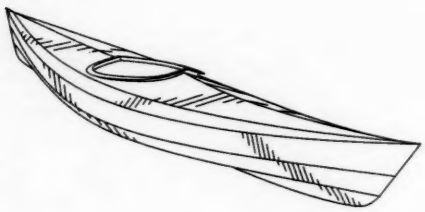


419,128

WATER CRAFT

John Lockwood, 227 Jackson St., Port Townsend, Wash. 98368

Filed Feb. 9, 1999, Appl. No. 100,414
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—302

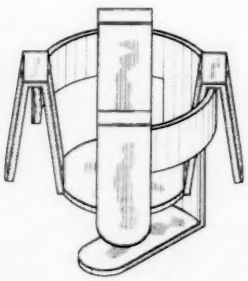


419,129

VEHICLE BEVERAGE HOLDER

Michael J Kilderry; Rose R Kilderry, and Shirley McKinzie, all of 727 S. 77th Ter., Kansas City, Kans. 66111

Filed Sep. 10, 1998, Appl. No. 93,391
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—411

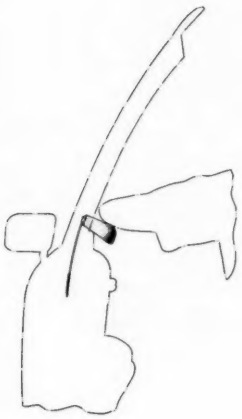


419,130

AUTOMOTIVE ARM REST

James Adam Dyment, 429 Sunny Acres Dr., Cincinnati, Ohio 45255

Filed Jul. 13, 1999, Appl. No. 107,721
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—421

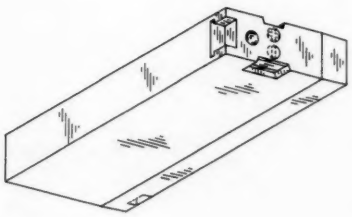


419,131

BATTERY CASE

Jonathan Neal Andrews, McMinnville; Stephen Vance Cooper, Amity; Gregory Dean Brink, and David Lynn Burton, both of McMinnville, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 22, 1999, Appl. No. 99,534
Term of patent 14 years
LOC (6) Cl. 13 - *02*
U.S. Cl. D13—103



419,132

STORAGE BATTERY

Yoshie Suzuki; Yoshitaka Sunagawa; Masayuki Ide, and Toshihiro Inoue, all of Aichi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

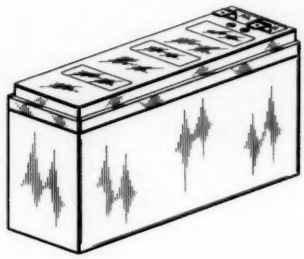
Filed Feb. 8, 1999, Appl. No. 100,250

Claims priority, application Japan, Aug. 20, 1998, 10-23963

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—104



419,133

CONNECTOR FOR A BATTERY

Tooru Yoshida, and Iwao Ishibashi, both of Kanagawa, Japan, assignors to SMK Co., Ltd., Tokyo, Japan

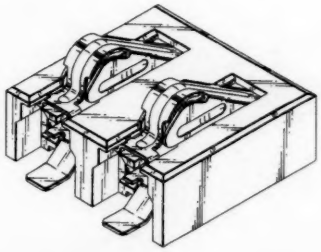
Filed Oct. 19, 1998, Appl. No. 95,184

Claims priority, application Japan, Jun. 9, 1998, 10-16471

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—120



419,134

ELECTRIC CONNECTOR

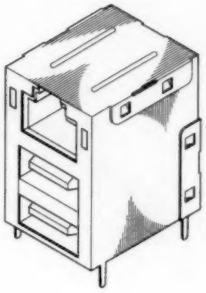
Tzu-Chin Chen, Taipei Hsien, Taiwan, assignor to Tekcon Electronics Corp., Taipei Hsien, Taiwan

Filed Mar. 23, 1999, Appl. No. 102,365

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—146



419,135

ELECTRICAL CONNECTOR

Kun-Tsan Wu, Tu-Chen, and Fu-Keng Yang, Taipei, both of Taiwan, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

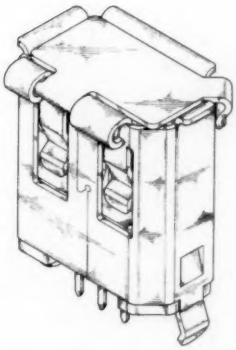
Filed Dec. 28, 1998, Appl. No. 98,445

Claims priority, application Taiwan, Aug. 7, 1998, 87305788

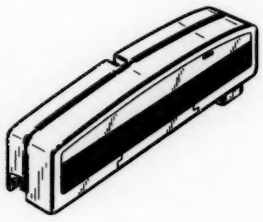
Term of patent 14 years

LOC (6) Cl. 13 - *03*

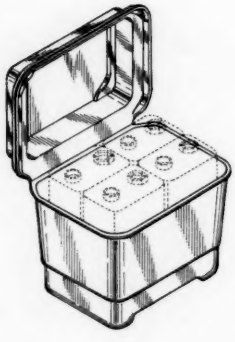
U.S. Cl. D13—147



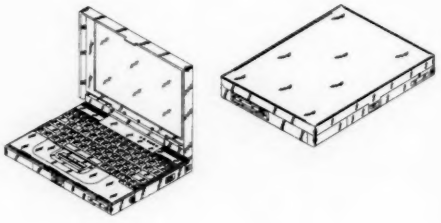
419,136
WIRELESS CONNECTOR FOR A HAND HELD GAME MACHINE
Masao Tomizawa, Toyonaka, Japan, assignor to SNK Corporation, Japan
Filed Mar. 26, 1999, Appl. No. 102,508
Claims priority, application Japan, Sep. 29, 1998, 10-28024
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—147



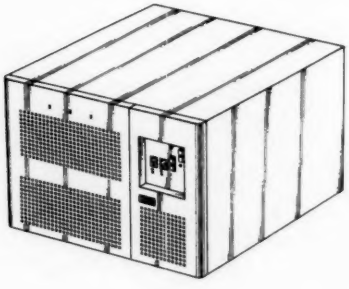
419,137
9V BATTERY PACKAGE
Robert C. Gaffney, Sun Prairie; Gerald A. Albright; Ron G. Hellenbrand, both of Middleton, and Ross Mack, Dane, all of Wis., assignors to Rayovac Corporation, Madison, Wis.
Continuation-in-part of application No. 29/100,236, Feb. 8, 1999, and application No. 29/101,481, Mar. 5, 1999, which is a division of application No. 29/094,324, Sep. 30, 1998. This application Jun. 24, 1999, Appl. No. 107,054.
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D13—423



419,138
NOTEBOOK PERSONAL COMPUTER
Toshitaka Imai, Sagamihara, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 1, 1997, Appl. No. 80,138
Claims priority, application Japan, Jun. 6, 1997, 9-57199
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—106



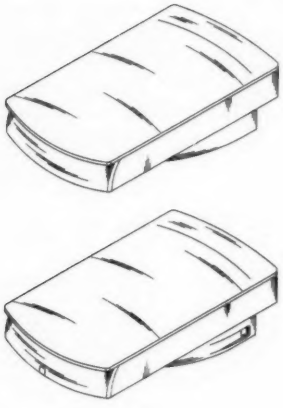
419,139
DATA TRANSFER MACHINE FOR ELECTRONIC COMPUTERS
Takashi Kohara, Tachikawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 3, 1998, Appl. No. 97,344
Claims priority, application Japan, Aug. 26, 1998, 10-24290
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



419,140
SCANNER

Modest Khovaylo, and James C. Dow, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

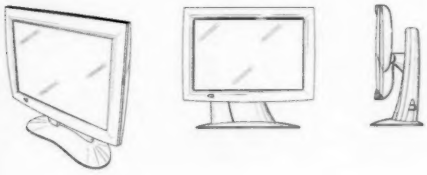
Division of application No. 29/094,295, Sep. 29, 1998, Pat. No. Des. 410,444, which is a division of application No. 29/075,936, Aug. 28, 1997. This application Feb. 17, 1999, Appl. No. 100,743.
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



419,141
DISPLAY ASSEMBLY

Daniel E. Evanicky, San Jose; Tina Zimmermann, San Francisco, and Bob Brunner, Los Gatos, all of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

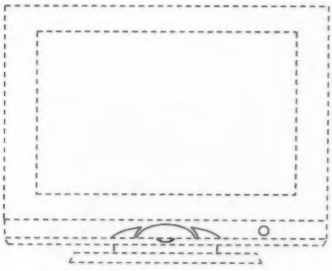
Filed Jul. 22, 1998, Appl. No. 91,100
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—113



419,142
MONITOR BUTTONS

Holger Lampatz, Gladbeck, Germany, assignor to Maxdata Computer GmbH, Marl, Germany

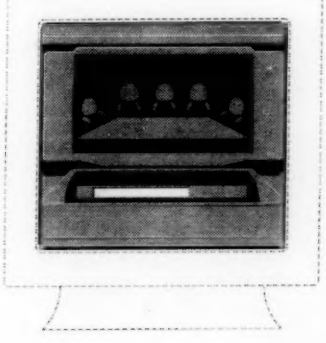
Filed Dec. 8, 1998, Appl. No. 97,549
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—113



419,143
USER INTERFACE ICON FOR A DISPLAY SCREEN OF A COMMUNICATIONS TERMINAL

Stephen Andrew Baker, Thornton, Colo.; April Denise McGee, Piscataway, N.J.; Michelle McNerney, Freehold, N.J.; Richard L. Pastore, Brick, N.J., and Robin S. Wells, New York, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of application No. 29/051,161, Mar. 4, 1996, Pat. No. Des. 400,520. This application May 8, 1998, Appl. No. 87,756.
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.1



419,144

USER INTERFACE ICON FOR A DISPLAY SCREEN OF A COMMUNICATIONS TERMINAL

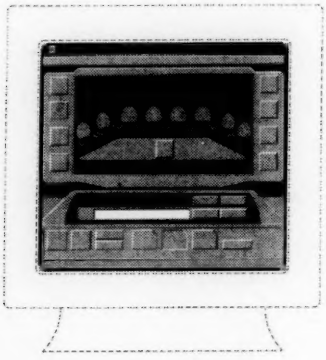
Stephen Andrew Baker, Thornton, Colo.; April Denise McGee, Piscataway, N.J.; Michelle McNerney, Freehold, N.J.; Richard L. Pastore, Brick, N.J., and Robin S. Wells, New York, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of application No. 29/051,161, Mar. 4, 1996, Pat. No. Des. 400,520. This application May 8, 1998, Appl. No. 87,757.

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.1



419,145

USER INTERFACE ICON FOR A DISPLAY SCREEN OF A COMMUNICATIONS TERMINAL

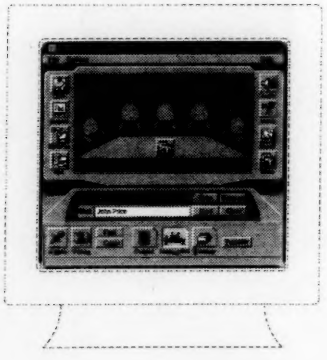
Stephen Andrew Baker, Thornton, Colo.; April Denise McGee, Piscataway; Michelle McNerney, Freehold, both of N.J.; Richard L. Pastore, Brick, N.J., and Robin S. Wells, New York, N.Y., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Division of application No. 29/051,161, Mar. 4, 1996, Pat. No. Des. 400,520. This application May 8, 1998, Appl. No. 87,758.

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.1



419,146

"SELECT ALL" ICON FOR A DISPLAY SCREEN

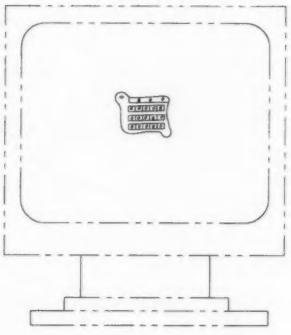
Hyejung Hwang, and Walter C. Bubie, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 7, 1998, Appl. No. 90,340

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.3



419,147

FACE PLATE FOR DATA STORAGE ENCLOSURE

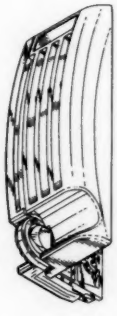
Herbert J Tanzer, Folsom; Henry Jupille, Placerville, both of Calif., and Darrel W Poulter, Middleton, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 13, 1998, Appl. No. 96,564

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—115



419,148

BEZEL FOR RACK MOUNTED DEVICE

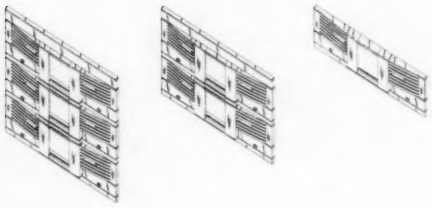
Wayne E. Foslien, Greeley; Joseph M. White, Windsor, both of Colo.; Seiya Ohta, Rocklin, Calif., and Gerald L. Hartkopf, Erie, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 26, 1999, Appl. No. 99,682

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—115



419,149

FRONT CASING PORTION OF HAND HELD SCANNING TOOL

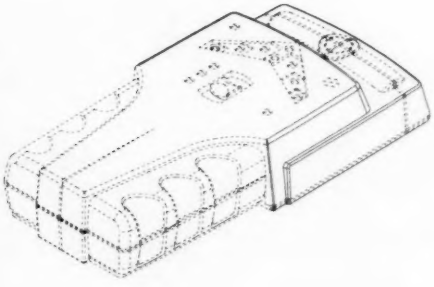
Norman L. Krantz, San Jose, and John R. Stauss, Los Gatos, both of Calif., assignors to Zircon Corporation, Campbell, Calif.

Filed Aug. 13, 1998, Appl. No. 92,144

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—116



419,150

COMPUTER MOUSE

Mark C. Oursler, 1511 Shadyside Rd., Baltimore, Md. 21218

Filed Nov. 13, 1998, Appl. No. 96,468

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—117.3

419,151

COMPACT DISC

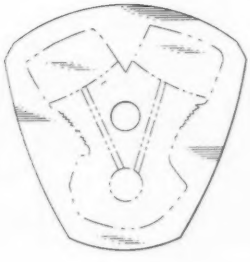
Jurgen Koedel, Eichborndamm 108, Berlin, Germany, D-13403

Filed Dec. 18, 1997, Appl. No. 80,884

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—121



419,152

COMPACT DISK/MINI DISK

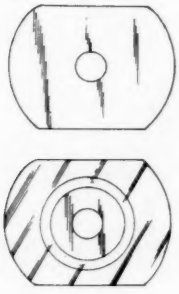
Rod Lowenstein, Jericho, N.Y., assignor to Shape CD, Inc., New York, N.Y.

Filed Feb. 11, 1999, Appl. No. 100,480

Term of patent 14 years

LOC (6) Cl. 14 - *99*

U.S. Cl. D14—121



419,153

MOTION PICTURE VIDEO DISPLAY DEVICE

Alan Amron, Syosset, N.Y., assignor to Videochip Technology

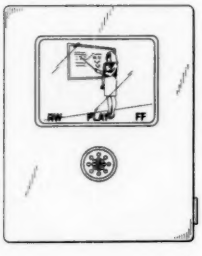
Filed Sep. 8, 1998, Appl. No. 93,304

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—124



419,154

HOUSING FOR A PORTABLE COMMUNICATIONS DEVICE

Michael J. Page, Aventura, and Scott Richards, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 10, 1999, Appl. No. 104,620

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—137

419,155

CELLULAR TELEPHONE HOUSING

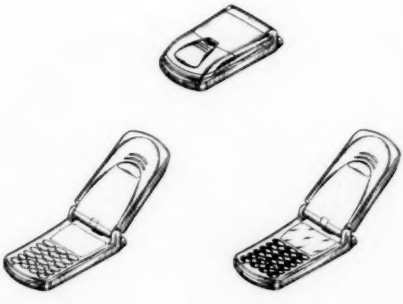
Albert L. Nagele, Wilmette, and Victor J. Hukill, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1999, Appl. No. 107,316

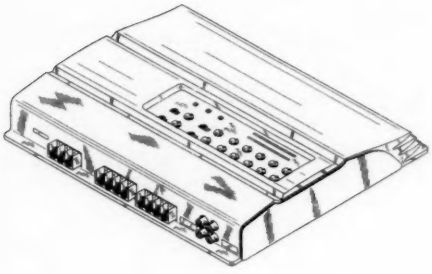
Term of patent 14 years

LOC (6) Cl. 14 - *03*

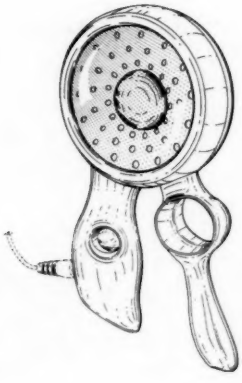
U.S. Cl. D14—138



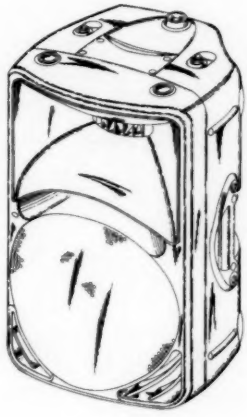
419,156
AMPLIFIER
Akira Yamazaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 8, 1998, Appl. No. 94,708
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—188



419,157
RADIO
Paul Stephen Haney, Noblesville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Feb. 16, 1999, Appl. No. 100,622
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—192



419,158
SPEAKER
Greg C. Mackie, Kirkland, and Joseph L. Erno, Snohomish, both of Wash., assignors to Mackie Designs, Inc., Woodinville, Wash.
Filed Jan. 26, 1999, Appl. No. 99,671
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—214



419,159
ANTENNA
Leonard A. Davi, Lake Mary, and R. Sean Hagen, Winter Park, both of Fla., assignors to Recoton Corporation, Lake Mary, Fla.
Filed Feb. 1, 1999, Appl. No. 99,974
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—230

419,160

PERSONAL COMMUNICATIONS UNIT DOCKING STATION

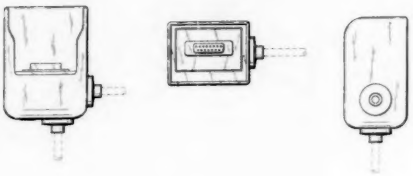
Steven F. Davidson, Skokie; Kim D. Vollendorf, Cary; Michael F. DiCicco, Carol Stream; David C. Brown; Christopher C. Gielow, both of Chicago, and David J. Cottingham, Wilmette, all of Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed May 14, 1998, Appl. No. 88,089

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—253



419,161

DRAIN PUMP

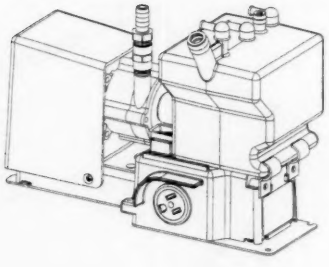
Steven L. Broughton, Duncanville, Tex., assignor to Beckett Corporation, Irving, Tex.

Filed Apr. 6, 1999, Appl. No. 103,004

Term of patent 14 years

LOC (6) Cl. 15 - *02*

U.S. Cl. D15—7



419,162

RECIPROCATING COMPRESSOR

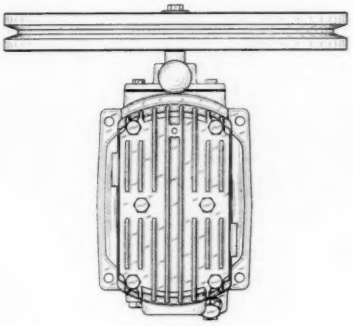
Brian David Wise, and Mohammad Abdallah, both of Charlotte, N.C., assignors to Ingersoll-Rand Company, Woodcliff, N.J.

Filed Aug. 17, 1998, Appl. No. 92,317

Term of patent 14 years

LOC (6) Cl. 15 - *02*

U.S. Cl. D15—9



419,163

MOWER SHROUD

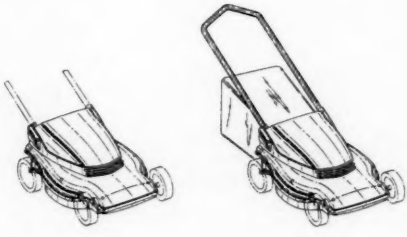
Michael G. Sirois, Ottawa, Canada; Bruce W. Brooks, Pembroke Pines, Fla.; Colin M. Dyke, North Augusta, Canada; Roderick D. Muir, South Mountain, Canada; David S. Strong, Battersea, Canada; Richard P. Rosa, Brookville, Canada; Brian S. Burnett, Mallorytown, Canada, and Lawrie Cunningham, Cleveland, United Kingdom, assignors to Black & Decker Inc., Newark, Del.

Continuation-in-part of application No. 29/027,102, Aug. 12, 1994, abandoned. This application Jul. 24, 1995, Appl. No. 42,994.

Term of patent 14 years

LOC (6) Cl. 15 - *03*

U.S. Cl. D15—14



419,164

HOOD AND GRILL

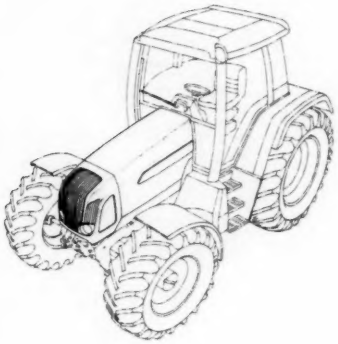
Roland Heiler, Buxheim, and Johann Epple, Marktoberdorf, both of Germany, assignors to AGCO GmbH & Co., Germany

Filed Sep. 16, 1998, Appl. No. 93,671

Term of patent 14 years

LOC (6) Cl. 15 - *03*

U.S. Cl. D15—31



419,165

WOODWORKING MACHINE

Wolfgang Müller, Schwaigern, and Heiner Englert, Lauda-Königshofen, both of Germany, assignors to Michael Weinig Aktiengesellschaft, Tauberbischofsheim, Germany

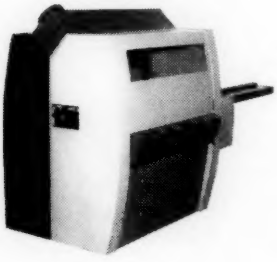
Filed Jun. 19, 1998, Appl. No. 89,658

Claims priority, application Germany, Dec. 19, 1997, M 97 11 756

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—127



419,166

LENS FOR PROTECTIVE EYEGLASSES

Klaus Wiedner, Fürth/Bay, Germany, assignor to Uvex Arbeitsschutz GmbH, Furth/Bay, Germany

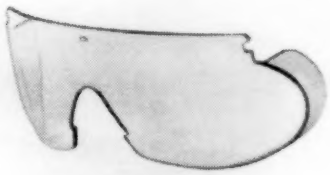
Division of application No. 29/075,540, Sep. 2, 1997, Pat. No. Des. 404,416. This application Sep. 10, 1998, Appl. No. 93,434.

Claims priority, application WIPO, Mar. 3, 1997, DM/039399

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—101



419,167

EYEWEAR LENS

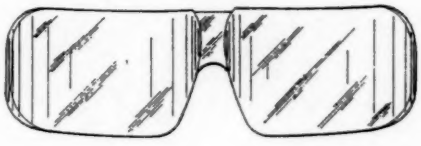
James Hall, Lincoln, R.I.; Raoul Desy, Sturbridge, and John Salce, Auburn, both of Mass., assignors to Cabot Safety Intermediate Corporation, Newark, Del.

Division of application No. 29/075,626, Sep. 3, 1997, which is a continuation-in-part of application No. 29/054,492, May 2, 1996, Pat. No. Des. 397,126. This application Mar. 2, 1999, Appl. No. 101,373.

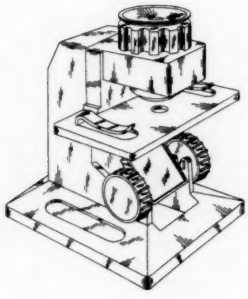
Term of patent 14 years

LOC (6) Cl. 16 - *06*

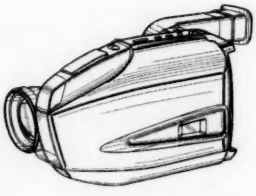
U.S. Cl. D16—101

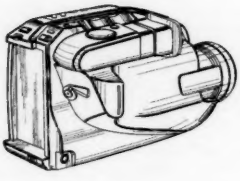


419,168
MICROSCOPE
Richard L. Franks; Dianne S. Gerlach; Daniel E. James; David A. Middendorf; Bobby E. Mize; Cynthia A. Morgan; Stevens H. Scott; Klaus Wirbelauer, and Gina C. Wofford, all of Burlington, N.C., assignors to Carolina Biological Supply Company, Burlington, N.C.
Filed Apr. 27, 1999, Appl. No. 104,026
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—131



419,169
COMBINED VIDEO CAMERA WITH VIDEO TAPE RECORDER
Koji Masano, Ehime, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan
Filed Dec. 7, 1998, Appl. No. 97,438
Claims priority, application Japan, Dec. 6, 1998, 10-16922
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202





419,170
DOCUMENT CAMERA
Arata Ono, Urawa, and Masaaki Yanagisawa, Chigasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Jul. 29, 1998, Appl. No. 91,387
Claims priority, application Japan, Feb. 2, 1998, 10-2737
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—208

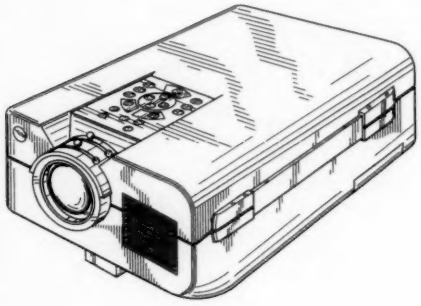
419,171
CAMERA
Takaharu Kato, Chino, Japan, assignor to Cosina Co., Ltd., Nagano, Japan
Filed Sep. 4, 1998, Appl. No. 93,374
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—218

419,172

VIDEO PROJECTOR

Taisuke Saeki; Harumi Sakamoto; Seiji Kurokawa; Kohichi Iida, all of Tochigi-ken, and Kiyomi Usui, Kanagawa-ken, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1998, Appl. No. 97,537
Claims priority, application Japan, Jun. 9, 1998, 10-16583
Term of patent 14 years
LOC (6) Cl. 16 - *02*
U.S. Cl. D16—231

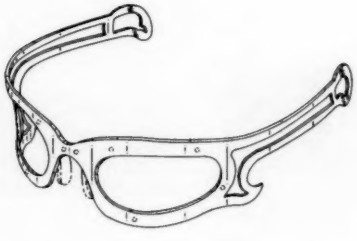


419,173

EYEGLASS FRAME

Joel A. Grimaldi, 6 Auburndale Dr., Pittsford, N.Y. 14534

Filed Feb. 11, 1999, Appl. No. 100,439
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—321

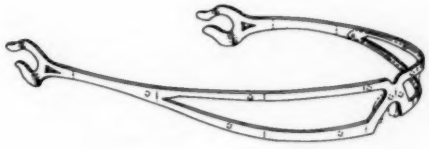


419,174

EYEGLASS FRAME

Joel A. Grimaldi, 6 Auburndale Dr., Pittsford, N.Y. 14534

Filed Feb. 11, 1999, Appl. No. 100,443
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—321

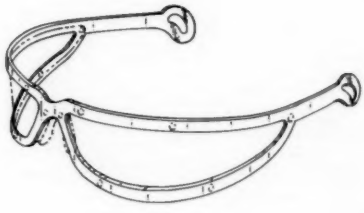


419,175

EYEGLASS FRAME

Joel A. Grimaldi, 6 Auburndale Dr., Pittsford, N.Y. 14534

Filed Feb. 11, 1999, Appl. No. 100,448
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—321



419,176

EYEWEAR

Henri Brune, Fleurieux sur l'Abresle, France, assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 6, 1998, Appl. No. 87,589

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—326

419,177

EYEGLASS CLIP

William Bolling, and Maryann Bolling, both of 7856 Mears Rd., Auburn, Calif. 95602

Filed Aug. 20, 1998, Appl. No. 92,511

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—336

419,178

PAPER IMPRESSION DEVICE

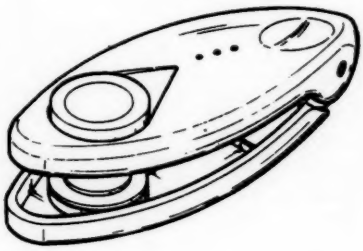
Ok-Hwan Kim, and Wan-Young Oh, both of Seoul, Rep. of Korea, assignors to DN Craft Corporation, Seoul, Rep. of Korea

Filed May 26, 1998, Appl. No. 88,480

Term of patent 14 years

LOC (6) Cl. 19 - *02*

U.S. Cl. D18—15



419,179

STAMP

Seiji Nakamura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan

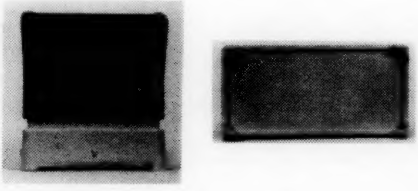
Filed Jul. 29, 1998, Appl. No. 91,411

Claims priority, application Japan, Feb. 3, 1998, 10-2889; Feb. 3, 1998, 10-2890

Term of patent 14 years

LOC (6) Cl. 19 - *02*

U.S. Cl. D18—15



419,180

STAMP PAD CONTAINER

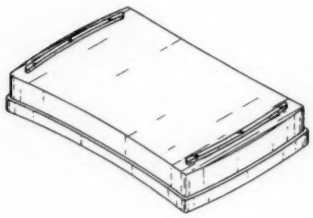
Rira Yasoshima, Tokyo, Japan, assignor to Tsukineko, Inc., Redmond, Wash.

Division of application No. 29/060,503, Sep. 30, 1996, Pat. No. Des. 400,567. This application Dec. 31, 1997, Appl. No. 83,399.

Term of patent 14 years

LOC (6) Cl. 19 - *02*

U.S. Cl. D18—17



419,181

IMAGE FORMING APPARATUS

Hidero Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1998, Appl. No. 92,049

Claims priority, application Japan, Feb. 18, 1998, 10-004248

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D18—40

419,182

TONER CARTRIDGE

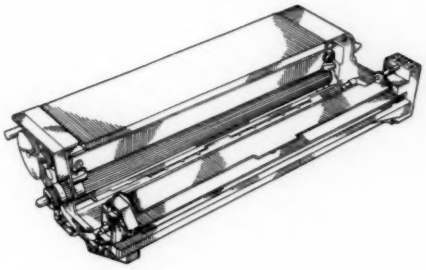
Kiyonori Tsuda, Machida, and Nobuki Matsumoto, Miura, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 25, 1998, Appl. No. 97,026

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D18—43



419,183

LOCKING HUB

John D. Stouffer, South Bend, Ind., assignor to Stouffer Industries, Inc., South Bend, Ind.

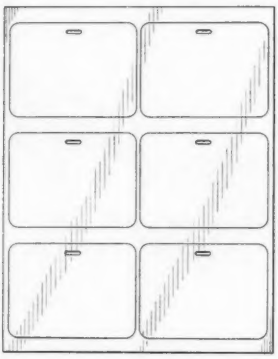
Filed Mar. 16, 1998, Appl. No. 85,070

Term of patent 14 years

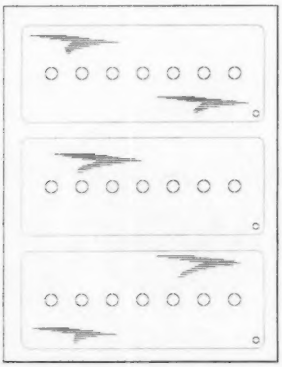
LOC (6) Cl. 18 - *02*

U.S. Cl. D18—56

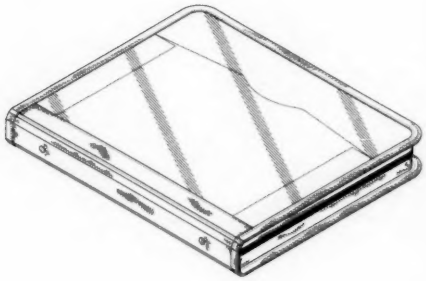
419,184
LASER PRINTABLE CARD BADGE SHEET
David J. Haas, and Sandra Haas, both of Suffern, N.Y., assignors to Temtec, Inc., Suffern, N.Y.
Filed Dec. 23, 1997, Appl. No. 81,220
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 19 - *01*
U.S. Cl. D19—1



419,185
PERFORATED PAPER BLANK FOR COLOR MATCHING STRIPS
James R. Teter, Minneapolis, and Thor A. Olson, Minnetonka, both of Minn., assignors to Management Graphics, Inc., Minneapolis, Minn.
Filed Jan. 19, 1999, Appl. No. 99,294
Term of patent 14 years
LOC (6) Cl. 19 - *01*
U.S. Cl. D19—1



419,186
BINDER WITH TRANSLUCENT COVERS
Marc Moor, Oakwood, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 3, 1998, Appl. No. 96,014
Term of patent 14 years
LOC (6) Cl. 19 - *04*
U.S. Cl. D19—27



419,187
BUILDING BLOCK-TYPE WRITING IMPLEMENT
Cheng-hua Chuang, Taipei, Taiwan, assignor to Pioneer Industrial Corporation, Taipei, Taiwan
Filed Oct. 2, 1998, Appl. No. 94,487
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—36

419,188

COMBINED COMPASS AND WRITING INSTRUMENT

Christian Leibeck, Nürnberg, Germany, assignor to J. S. Staedtler GmbH & Co., Nürnberg, Germany

Filed Oct. 7, 1998, Appl. No. 94,669

Claims priority, application Germany, Apr. 17, 1998, M 98 03 840

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—36

419,189

WRITING INSTRUMENT

Henning Hartge, Nürnberg, Germany, assignor to J. S. Staedtler GmbH & Co., Nürnberg, Germany

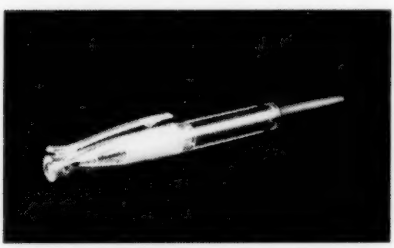
Filed Sep. 10, 1998, Appl. No. 93,419

Claims priority, application Germany, Mar. 17, 1998, 98 02 698

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—51



419,190

TOY DRAWING BOARD

Kai-Shun Mak, Kwai Chung, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Hop Lee Cheong Industrial Company Ltd., Hong Kong, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Jan. 25, 1999, Appl. No. 99,625

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—52

419,191

SUBSTRATE FOR DYNAMIC MAP

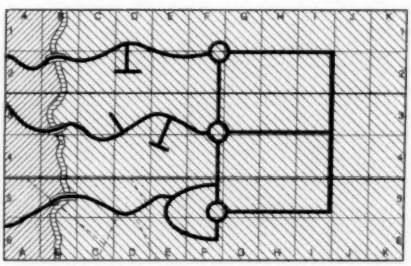
Yesha Y. Sivan, Ramat Hasharon, Israel, assignor to The Knowledge Infrastructure Ltd., Shefayim, Israel

Filed Mar. 23, 1999, Appl. No. 102,419

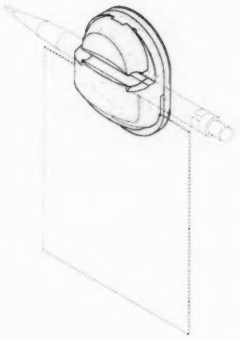
Term of patent 14 years

LOC (6) Cl. 19 - *07*

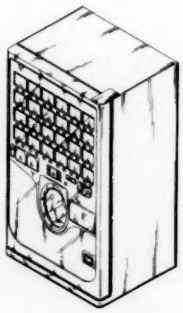
U.S. Cl. D19—61



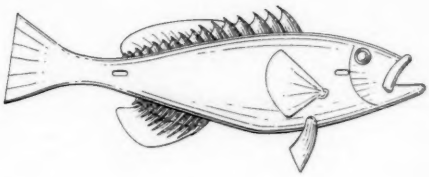
419,192
MAGNET MEMO CLIP AND PEN HOLDER
Te-Ming Huang, 1F, No. 6, Lane 43, Shui-Yuan Road, Taipei, Taiwan
Filed May 3, 1999, Appl. No. 104,319
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D19—78



419,193
AUTOMATIC VENDING MACHINE FOR DRINKS
Hideyuki Kojima; Toshiro Fujii; Shingo Iwata, and Yoshikazu Saito, all of Osaka-fu, Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan
Filed Apr. 30, 1999, Appl. No. 104,271
Claims priority, application Japan, Nov. 2, 1998, 10-31786
Term of patent 14 years
LOC (6) Cl. 20 - *01*
U.S. Cl. D20—4



419,194
LICENSE PLATE
Jorge Amores, 3895 W. 9 Ave., Hialeah, Fla. 33012
Filed May 22, 1998, Appl. No. 88,415
Term of patent 14 years
LOC (6) Cl. 20 - *03*
U.S. Cl. D20—14



419,195
SIGN
Yaacov T. Herbst, Bnei Braq, Israel, assignor to Park Media, Ltd., Staten Island, N.Y.
Filed May 11, 1999, Appl. No. 104,754
Term of patent 14 years
LOC (6) Cl. 20 - *03*
U.S. Cl. D20—19

419,196

FUEL TANK INLET LOCATION INDICATOR

Douglas B. K. Lewis, and Beverly C Lewis, both of 6636 Twining Way, Citrus Heights, Calif. 95621

Filed Dec. 3, 1998, Appl. No. 97,312

Term of patent 14 years

LOC (6) Cl. 19 - *08*

U.S. Cl. D20—35

419,197

CURB SIGN

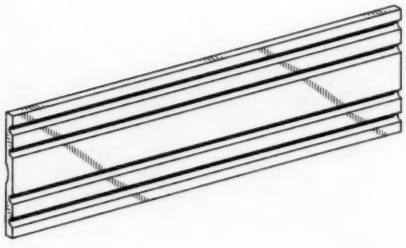
Ernest Joyner, III, Hampton, S.C., assignor to Carsonite International Corporation, Early Branch, S.C.

Filed Jul. 16, 1998, Appl. No. 90,781

Term of patent 14 years

LOC (6) Cl. 20 - *03*

U.S. Cl. D20—44



419,198

CARTRIDGE FOR GAME MACHINE

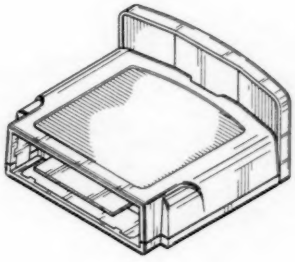
Kenichiro Ashida, and Kazunori Koshiishi, both of Kyoto, Japan, assignors to Nintendo Co., Ltd., Japan

Filed Oct. 21, 1998, Appl. No. 95,325

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—332



419,199

GAME MACHINE AND CONSOLE STACK

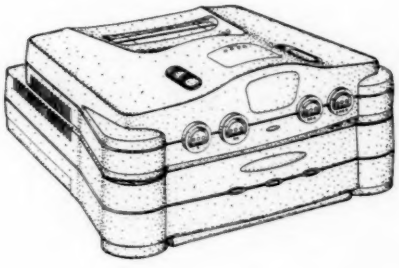
John Cordell, Redmond, Wash., and Kenichiro Ashida, Kyoto, Japan, assignors to Nintendo of America Inc., Redmond, Wash.

Filed Apr. 14, 1999, Appl. No. 103,368

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—332



419,200

GAME MACHINE AND DISK DRIVE STACK

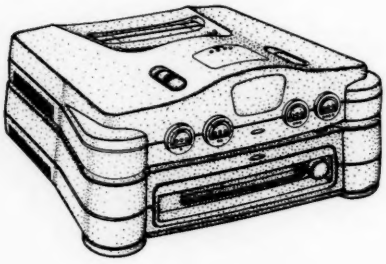
Kenichiro Ashida, Kyoto, Japan, assignor to Nintendo of America Inc., Redmond, Wash.

Filed Apr. 14, 1999, Appl. No. 103,369

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—332



419,201

GAMBLING MACHINE

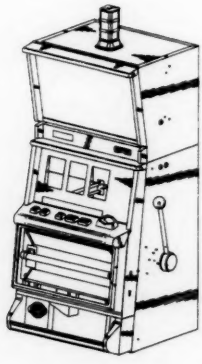
Henricus Wilhelmus de Haas, Oirschot, Netherlands, assignor to Orion Casino Technology BV, Netherlands

Filed Mar. 20, 1998, Appl. No. 85,317

Term of patent 14 years

LOC (6) Cl. 21 - *03*

U.S. Cl. D21—370



419,202

RANDOM NUMBER SELECTOR

James R Johns, 227 Sherman St., Watertown, N.Y. 13601

Filed Apr. 15, 1999, Appl. No. 103,498

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—371

419,203

TOY SPACE SAUCER BUBBLE BLOWER

Wei Gang Bao, Hefei, China, assignor to Golden Bright Manufacturer Ltd., Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

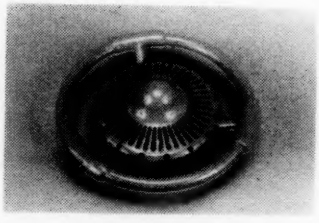
Filed Apr. 29, 1999, Appl. No. 104,165

Claims priority, application The Hong Kong Special Administrative Region of the People's Republic of China, Feb. 5, 1999, 9910176

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—401



419,204

TOY SPACE PISTOL BUBBLE BLOWER

Wei Gang Bao, Hefei, China, assignor to Gold Bright Manufacturer Ltd., Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

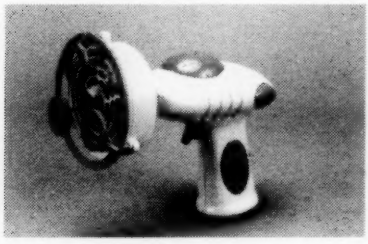
Filed Apr. 29, 1999, Appl. No. 104,197

Claims priority, application The Hong Kong Special Administrative Region of the People's Republic of China, Feb. 5, 1999, 9910176.2M001

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—401



419,205

COMBINED AIRPLANE AND PUMPING STATION

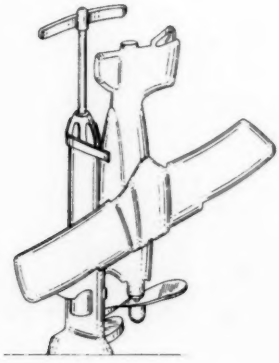
Charles D. Kownacki, Erie, Pa.; Jeffrey G. Rehkemper, Chicago, Ill., and Ronnen Harary, Toronto, Canada, assignors to Spin Master Toys, Ltd., Toronto, Canada

Filed Apr. 12, 1999, Appl. No. 103,242

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—447



419,206

TOY CAKE

Kam Wah Wei, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Wah Hing Toys Development Co., Ltd., Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Apr. 1, 1999, Appl. No. 102,883

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—483

419,207

INFLATABLE RACE CAR

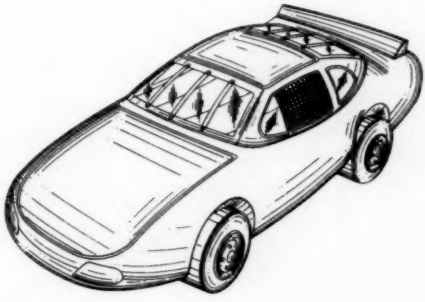
Marvin S. Lieberman, New York, N.Y., assignor to Alvimar Manufacturing Co., Inc., Long Island City, N.Y.

Filed Mar. 2, 1999, Appl. No. 101,378

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—549



419,208

MUSICAL NOTE CHARACTER

Avah Derderian Ham, 17443 Arminta St., Northridge, Calif. 91325

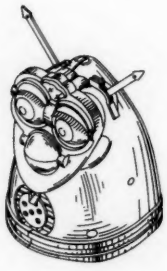
Filed Oct. 16, 1998, Appl. No. 95,132
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—627

419,209

ELECTRONIC TOY HOUSING

David Mark Hampton, Nevada City, Calif., and Caleb Chung, Boise, Id., assignors to Tiger Electronics, Ltd., Vernon Hills, Ill.

Continuation of application No. 09/211,101, Dec. 15, 1998.
This application Feb. 17, 1999, Appl. No. 100,763.
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—658

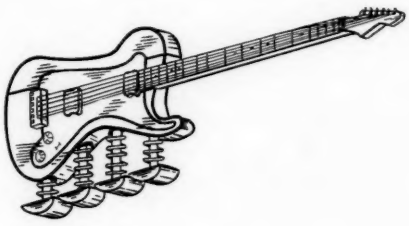


419,210

FINGER EXERCISER

Philippe Michel Paul Hug, Montpellier, France, assignor to Hug, Montpellier, France

Filed Jun. 1, 1998, Appl. No. 88,970
Claims priority, application France, Dec. 1, 1997, 97 7107
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—684

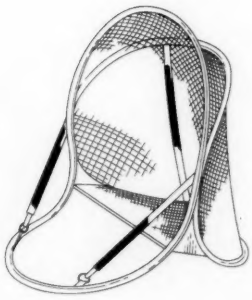


419,211

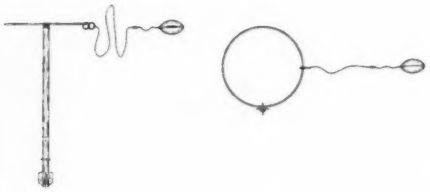
NET

Paul E. Lanham, 10224 Luman La., Twinsburg, Ohio 44087

Filed Feb. 11, 1999, Appl. No. 100,593
Term of patent 14 years
LOC (6) Cl. 21 - *99*
U.S. Cl. D21—705



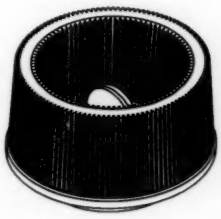
419,212
FOOTBALL PRACTICE AID
Grady L. Cooper, 4154 Butts Rd., Toomsuba, Miss. 39364
Filed Nov. 5, 1998, Appl. No. 96,150
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—716



419,213
GOLF CLUB HEAD WITH SLOT
Ronnie Pritchett, Poway, Calif., assignor to Bermuda Triangle Golf, LLC, Poway, Calif.
Filed Oct. 20, 1998, Appl. No. 95,260
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—744

419,214
GOLF CLUB HEAD WITH A PERFORATED FACE AND CAVITY BACK
Jack L. Hamm, Englewood, Colo., assignor to LongBall Sports, Inc., Englewood, Colo.
Filed Dec. 7, 1998, Appl. No. 97,454
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—750

419,215
FILTER FOR A WATER PURIFIER
Kil Ho Kim, #806-305 Mido Apartment, 60-4 Banpo-Dong, Seocho-Ku, Seoul, Rep. of Korea
Filed Feb. 24, 1999, Appl. No. 102,592
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—209



419,216

SUPPLY AND EXHAUST BLOCK FOR A MANIFOLD VALVE

Hideharu Sato, and Takumi Matsumoto, both of Tsukuba-gun, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Oct. 9, 1998, Appl. No. 94,774

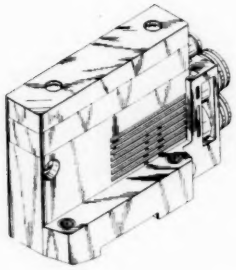
Claims priority, application Japan, Apr. 13, 1998, 10-10522

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—233



419,217

CHECK VALVE

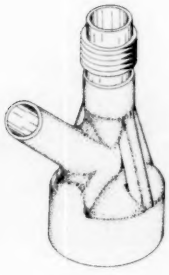
Kuo-Jium Lee, 10F, No. 69, Kang Ding Road, Taipei, Taiwan

Filed Oct. 19, 1998, Appl. No. 95,180

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—237



419,218

FAUCET HANDLE

Daniel Müllenmeister, Havixbeck, Germany, assignor to Friedrich Grohe AG, Hemer, Germany

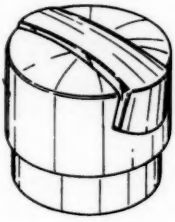
Filed May 18, 1999, Appl. No. 105,124

Claims priority, application Germany, Dec. 18, 1998, 49812216

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—238



419,219

FAUCET WITH PULL-OUT SPRAY

Judd A. Lord, Carmel, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.

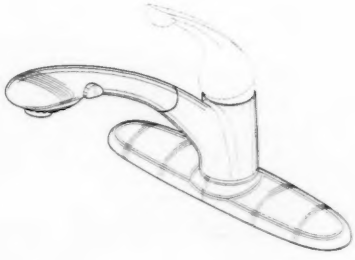
Filed Oct. 5, 1998, Appl. No. 94,545

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—243



419,220

LAVATORY HANDLE

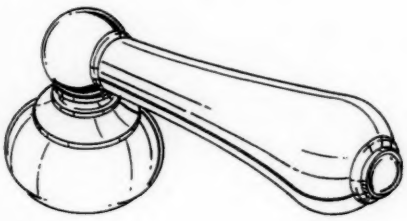
Ari Zev Warshawsky, New York; Jerome Warshawsky, Newlett Harbor, and Frank Antoniello, Commack, all of N.Y., assignors to IW Industries Inc., Melville, N.Y.

Filed Mar. 12, 1999, Appl. No. 101,917

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—252



419,221

WALL-MOUNT HANDLE ASSEMBLY FOR A MIXING VALVE

Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe AG, Hemer, Germany

Filed Sep. 18, 1998, Appl. No. 93,814

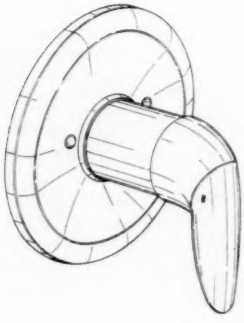
Claims priority, application Germany, Apr. 16, 1998, 98 03 680

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—254



419,222

HIGH RISE FAUCET WITH PULL-OUT SPRAY

Judd A. Lord, Carmel, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.

Filed Oct. 5, 1998, Appl. No. 94,533

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—255

419,223

FAUCET SPOUT

Alberto Meda, Milan, Italy, assignor to American Standard Inc., Piscataway, N.J.

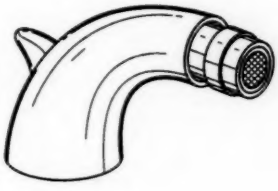
Filed Mar. 24, 1999, Appl. No. 102,401

Claims priority, application Italy, Sep. 25, 1998, RE98O000014

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—255



419,224

METRIC/AMERICAN ADAPTER

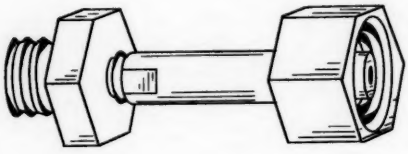
Richard R. Zito, 5511 N. Fort Yuma Trail, Tucson, Ariz. 85750

Filed Jun. 9, 1998, Appl. No. 89,149

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—262



419,225

SHOWER AND BATH TUB

Arne Johansson, Farstorp, Sweden, assignor to A. Johansson Konstruktion AB, Eslov, Sweden

Filed Jul. 15, 1998, Appl. No. 90,754

Claims priority, application Sweden, Jan. 26, 1998, 98-0148

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—280.2

419,226

COMMODE SEAT FOR AN INFANT

Hyun Bok Yu, 5641 Aspen St., Cypress, Calif. 90630

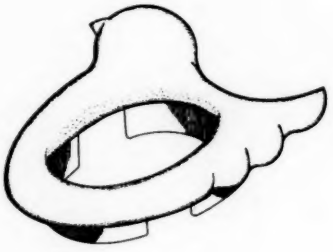
Filed Apr. 9, 1999, Appl. No. 103,194

Claims priority, application Rep. of Korea, Dec. 30, 1998, 98-23242

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—296



419,227

SLIDABLE SHOWER HEAD HOLDER

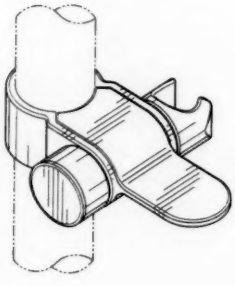
Gilad Ben-Tsur, Gan Ner, Israel, assignor to Alsons Corporation, Hillsdale, Mich.

Filed May 12, 1999, Appl. No. 104,787

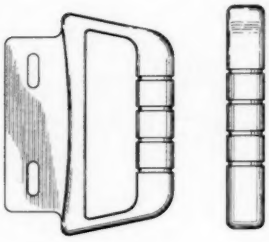
Term of patent 14 years

LOC (6) Cl. 23 - *02*

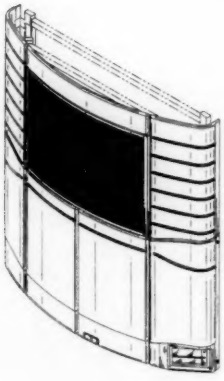
U.S. Cl. D23—304



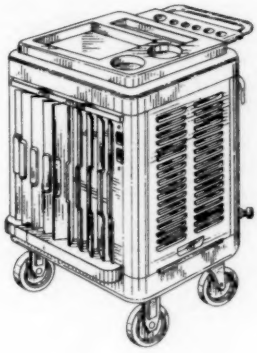
419,228
TOILET SEAT HANDLE
Laura Hewitt, 95 Credit Road Cheltenham, Ontario, Canada, L0P 1C0
Filed Feb. 18, 1999, Appl. No. 100,815
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—311



419,229
COVER FOR A TRANSPORT REFRIGERATION UNIT
Matthew J. Stevens, Liverpool, and Robert S. Simeone, Bridgeport, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Oct. 16, 1998, Appl. No. 95,097
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D23—325

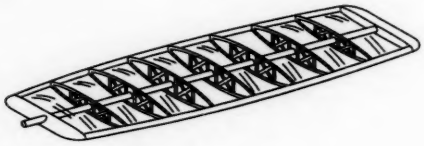


419,230
PORTABLE EVAPORATIVE COOLER
Ted Ciccone, Phoenix, Ariz., assignor to AdobeAir, Inc., Phoenix, Ariz.
Filed Aug. 13, 1998, Appl. No. 92,190
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—333



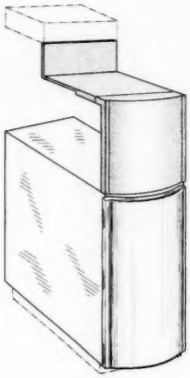
419,231
HIGH PRESSURE LIQUID CO_2 FILTER
Richard R. Zito, 5511 N. Fort Yuma Trail, Tucson, Ariz. 85750
Filed Jan. 15, 1999, Appl. No. 99,189
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—365

419,232
BLADE FOR A FAN
Gordon E. Bradt, Rte. 2, Box 470, Eureka Springs, Ark. 72632
Filed Sep. 14, 1998, Appl. No. 93,544
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—413

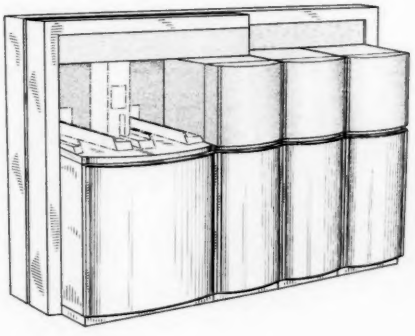


419,233
UNISEX SHORT WITH REVERSIBLE CONDOM
Roly R Brodie, 32 Beechwood Ct., Pittsburgh, Calif. 94565
Filed Nov. 5, 1998, Appl. No. 96,146
Term of patent 14 years
LOC (6) Cl. 28 - *01*
U.S. Cl. D24—105

419,234
EXTERIOR HOUSING FOR AN ANALYTICAL INSTRUMENT
Lutz Doms, Port Chester, N.Y., and Julian Schlagheck, Munich, Germany, assignors to Bayer Corporation, Tarrytown, N.Y.
Filed Jul. 14, 1998, Appl. No. 90,680
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—107



419,235
EXTERIOR HOUSING FOR AN ANALYTICAL INSTRUMENT
Lutz Doms, Port Chester, N.Y., and Julian Schlagheck, Munich, Germany, assignors to Bayer Corporation, Tarrytown, N.Y.
Filed Jul. 14, 1998, Appl. No. 90,685
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—107



419,236

SYRINGE-TYPE APPLICATOR

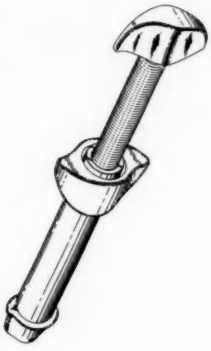
Bruce W. Carlson, Minneapolis, and John W. Dubbe, Oakdale, both of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Oct. 2, 1998, Appl. No. 94,455

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—114



419,237

OCTAGONAL SYRINGE HOLDER

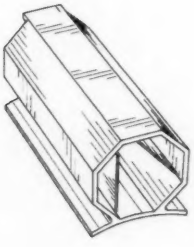
Robert N. Priebe, Bloomington, Minn., assignor to Apothecary Products, Inc., Burnsville, Minn.

Filed Nov. 20, 1998, Appl. No. 96,816

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—130



419,238

DISPOSABLE DENTAL APPLICATOR HANDLE

Fari Maissami, Hinsdale, Ill., assignor to Denbur, Inc., Oak Brook, Ill.

Filed Dec. 3, 1998, Appl. No. 97,305

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—152

419,239

EXTREMITY REHABILITATION APPARATUS

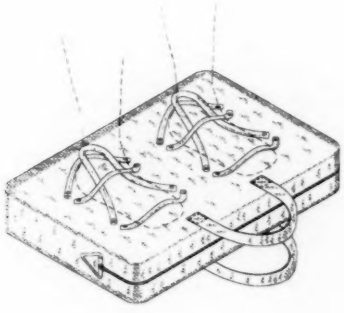
Edward I. Markovich, 10722 Denver Dr., Cooper City, Fla. 33026

Filed Dec. 8, 1998, Appl. No. 97,483

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—188



419,240

PACIFIER AND SIGNALING REMOTE CONTROL LOCATOR SET

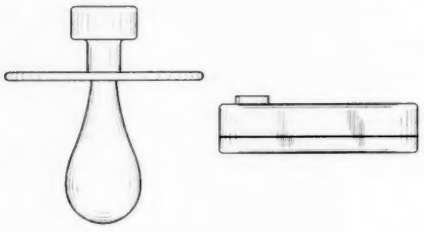
Paul Anthony Leick, 4177 Webster Ave. S., St Louis Park, Minn. 55416

Filed Apr. 24, 1997, Appl. No. 69,790

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—194



419,241

PHYTOCULTURE MICRO FLOW WORK STATION

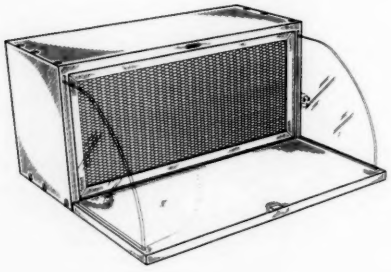
Donald Owen Northcott, P.O. Box 905, Cornwall, Prince Edward Island, Canada, C0A 1H0

Filed Oct. 16, 1998, Appl. No. 95,126

Term of patent 14 years

LOC (6) Cl. 24 - *01*

U.S. Cl. D24—234



419,242

PORTABLE DOCK FENDER

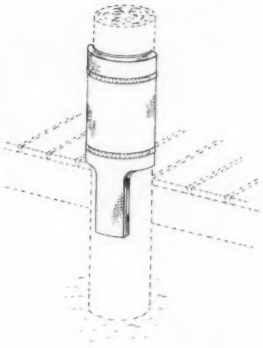
David R. Coons, Pickerington, Ohio, assignor to DC Athletics, Inc., Groveport, Ohio

Filed Apr. 9, 1999, Appl. No. 103,196

Term of patent 14 years

LOC (6) Cl. 25 - *02*

U.S. Cl. D25—35



419,243

LADDER LEG EXTENSION

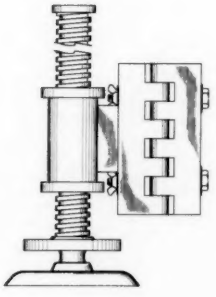
Gregory Goch, 15707 SE. 175th Pl., Renton, Wash. 98058

Filed Apr. 8, 1999, Appl. No. 103,121

Term of patent 14 years

LOC (6) Cl. 25 - *04*

U.S. Cl. D25—68



419,244

WINDOW COMPONENT EXTRUSION

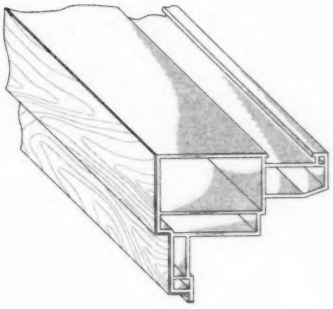
Jeffrey B. Hersh, Wayne, Pa.; Dennis Westphal, Parma, Mich.; Brian Opielski, Malvern, Pa., and Jerome C. Habeck, Holt, Mich., assignors to CertainTeed Corporation, Valley Forge, Pa.

Filed Dec. 29, 1998, Appl. No. 98,607

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—124



419,245

WINDOW COMPONENT EXTRUSION

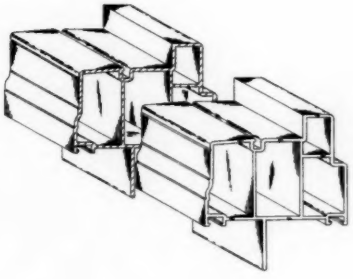
Jeffrey R. Franson, Maple Valley, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Feb. 12, 1999, Appl. No. 100,575

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—124



419,246

BUILDING MEMBER

Gerald Thomas Lane; Kerry Ronald Treloar; Cornelis La Grouw, and Johannes La Grouw, Sr., all of Rotorua, New Zealand, assignors to La Grouw Holdings Limited, Rotorua, New Zealand

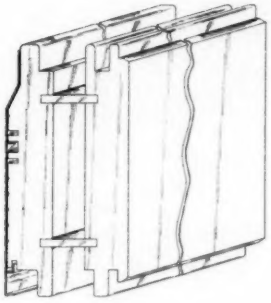
Filed Jun. 12, 1998, Appl. No. 89,328

Claims priority, application New Zealand, Dec. 12, 1997, 29012

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—138



419,247

LIGHT-UP BALL

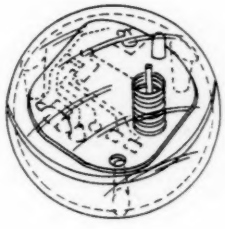
Brian Kessler, Las Vegas, Nev., assignor to Maui Toys, Inc., Los Angeles, Calif.

Filed Nov. 5, 1998, Appl. No. 96,121

Term of patent 14 years

LOC (6) Cl. 26 - *04*

U.S. Cl. D26—1



419,248

REFLECTOR FOR A DIRECTIONAL WARNING LIGHT

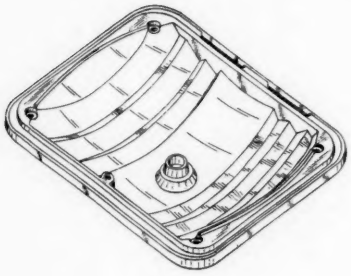
Harold W. Lyons, Edgewater, Fla., assignor to Whelen Engineering Company, Inc., Chester, Conn.

Filed Jun. 24, 1998, Appl. No. 89,856

Term of patent 14 years

LOC (6) Cl. 26 - *06*

U.S. Cl. D26—28



419,249

AERODYNAMIC REAR FACING LIGHT BAR FOR EMERGENCY VEHICLES

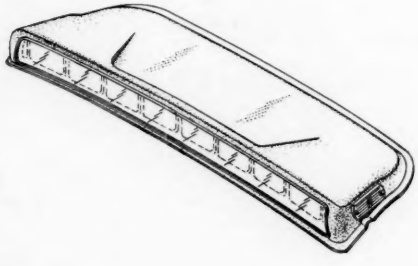
Robert B. Ford, Cromwell; Jon H. Lyons; John F. Olson, both of Deep River, and William J. Pokorney, Haddam, all of Conn., assignors to Whelen Engineering Company, Inc., Chester, Conn.

Filed Jul. 27, 1998, Appl. No. 91,304

Term of patent 14 years

LOC (6) Cl. 26 - *06*

U.S. Cl. D26—28



419,250

LAMP

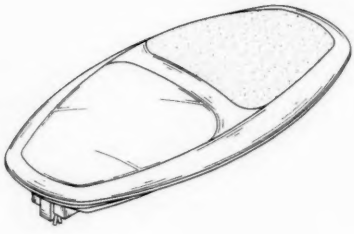
Neng-Chen Yeh, No. 10, Lane 808, Chungshan Rd., Hsinhua Chen, Tainan Hsien, Taiwan

Filed Mar. 30, 1999, Appl. No. 102,743

Term of patent 14 years

LOC (6) Cl. 26 - *06*

U.S. Cl. D26—28



419,251

FLASHLIGHT

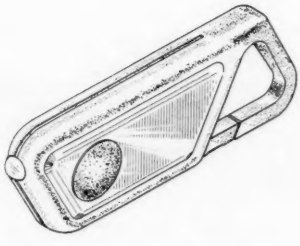
Kevin L. Parsons, Appleton, Wis.; Donald Keller, Irving, and W. Clay Reeves, Dallas, both of Tex., assignors to Armament Systems and Procedures, Inc., Appleton, Wis.

Continuation-in-part of application No. 29/088,501, May 26, 1998. This application Aug. 26, 1998, Appl. No. 92,753.

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—38



419,252

TOOL KIT LANTERN

Yuen Se Kit, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to John Manufacturing Ltd., Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

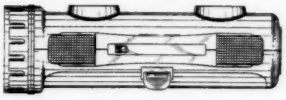
Filed Mar. 23, 1999, Appl. No. 102,357

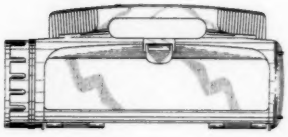
Claims priority, application The Hong Kong Special Administrative Region of the People's Republic of China, Feb. 5, 1999, 9910169

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—38





419,253

COMBINED LANTERN AND POWER SOURCE

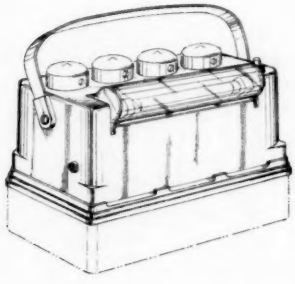
Charles W. Dowling, Phoenix, and Larry J. Reno, Scottsdale, both of Ariz., assignors to Industrias Diza S.A. de C.V., Apodaca, Mexico

Filed Mar. 25, 1999, Appl. No. 102,497

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—38



419,254

FLASHLIGHT

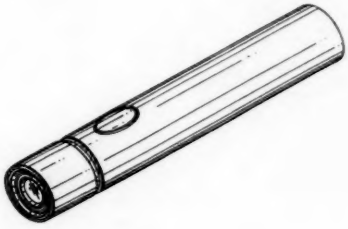
Terance Chi Ping Chiu, Hong Kong, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Forexim (H.K.) Limited, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Oct. 2, 1998, Appl. No. 94,463

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—49



419,255

LAMP

Marcus Jehs, Ulm, and Jürgen Laub, Neu Ulm, both of Germany, assignors to Nemo S.R.L., Meda, Italy

Filed Jul. 29, 1998, Appl. No. 91,391

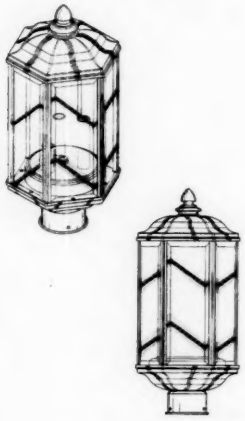
Claims priority, application Italy, Jan. 30, 1998, MI98O0065

Term of patent 14 years

LOC (6) Cl. 26 - *05*

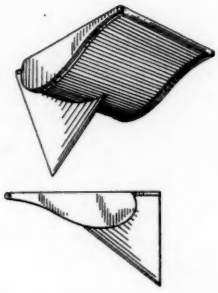
U.S. Cl. D26—65

419,256
EXTERIOR LANTERN
Leslie A. Meck, Fleetwood, and Rockwood T. Roberts, III, Shillington, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 30, 1998, Appl. No. 95,800
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—67

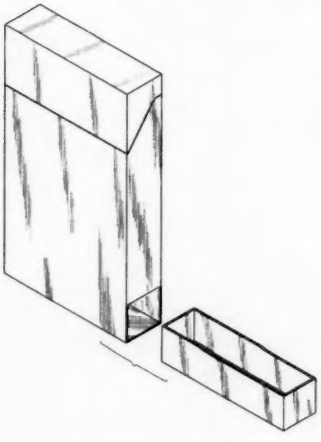


419,257
GARDEN LAMP
Hui-Piao Hsu, 8th Fl., No. 161, Sec. 5, Ming-Sheng Rd., Taipei, Taiwan
Filed Nov. 10, 1998, Appl. No. 96,322
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—67

419,258
WALL SCONCE
Charles Pfister, deceased, late of Healdsburg, Calif., by Jeffrey Weisman, heir, assignor to Louis Baldinger and Sons, Inc., Astoria, N.Y.
Filed Dec. 15, 1998, Appl. No. 97,827
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—87



419,259
MATCH AND CIGARETTE BOX
Claudius D Johnson, 9 Deerycombe House Brunel Estate Great Western Road, London, United Kingdom, W2 5UF
Filed Sep. 18, 1997, Appl. No. 76,723
Term of patent 14 years
LOC (6) Cl. 27 - *06*
U.S. Cl. D27—175

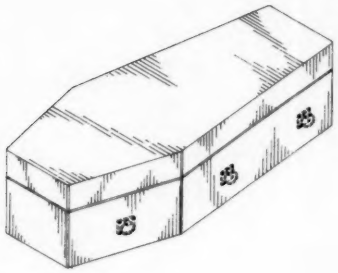


419,260

CIGAR HUMIDOR

William A. Manzo, Jr., 91 Standish Ave., Providence, R.I. 02908

Filed Nov. 23, 1998, Appl. No. 96,905
Term of patent 14 years
LOC (6) Cl. 27 - *06*
U.S. Cl. D27—188

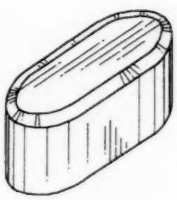


419,261

DETERGENT TABLET

Gary Benjamin Binstock, Freehold, N.J.; Bruce Cummings, New York, N.Y.; Divaker Kenkare; Kevin Mark Kinscherf, both of Freehold, N.J., and Steve Mark Phillips, Highland Park, N.J., assignors to Colgate-Palmolive, New York, N.Y.

Filed Mar. 20, 1998, Appl. No. 85,321
Term of patent 14 years
LOC (6) Cl. 28 - *02*
U.S. Cl. D28—8.1



419,262

SOLID BLOCK DETERGENT

Karen Gail Klaers, Inver Grove Heights; Scott T. Russell, Woodbury, and Tina Opal Outlaw, Inver Grove Heights, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

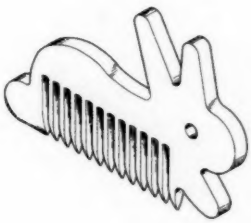
Filed Mar. 12, 1999, Appl. No. 101,852
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 28 - *02*
U.S. Cl. D28—8.1

419,263

COMB

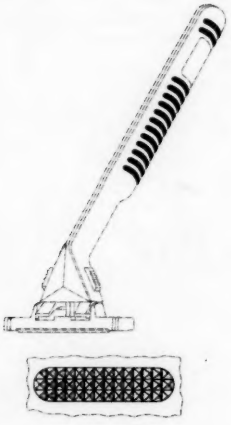
Kuo-Chin Chen, 2-1 Fl., No. 18, Alley 47, Lane 208, Jui An Street Ta An District, Taipei, Taiwan

Filed Mar. 19, 1999, Appl. No. 102,248
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—22



419,264
COMBINATION HAIR ORNAMENT AND RETAINING COMBS
Joyce A. Wallon, 1348 Arlington Cir., Hanover Park, Ill. 60103, and Ara Marie Sadowski, 17W070 Ardmore, Bensenville, Ill. 60106
Continuation-in-part of application No. 29/018,602, Feb. 9, 1994, abandoned. This application Aug. 5, 1996, Appl. No. 57,980.
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—25

419,265
GRIPPING ELEMENT FOR A RAZOR HANDLE
Michael John Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Continuation-in-part of application No. 29/035,224, Feb. 15, 1995, which is a continuation of application No. 07/948,970, Sep. 17, 1992, abandoned. This application Jan. 18, 1996, Appl. No. 49,154.
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—48



419,266
SLIM LIPSTICK CASE
Marc Gobe, New York, N.Y., assignor to Gryphon Development, New York, N.Y.
Filed Jan. 6, 1999, Appl. No. 98,787
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—89

419,267
SPORTS NECK BRACE
Byron V. Hartunian, 4 Saw Mill Brook Way, Woburn, Mass. 01801
Filed Jan. 7, 1999, Appl. No. 98,882
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D29—100

419,268

TOP FOR BIRD CAGE

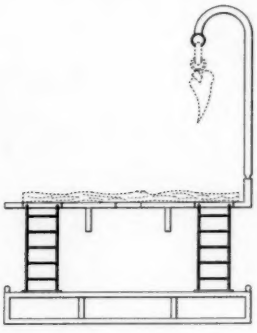
Carol E. Frank, Dallas, Tex., assignor to Avian Adventures, Inc., Dallas, Tex.

Filed Nov. 25, 1998, Appl. No. 97,021

Term of patent 14 years

LOC (6) Cl. 30 - *02*

U.S. Cl. D30—119



419,269

GIRTH BUCKLE

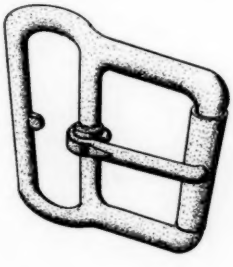
Jack L. Martin, Libertyville, Ill., assignor to Libertyville Saddle Shop Inc., Libertyville, Ill.

Filed Mar. 23, 1998, Appl. No. 85,394

Term of patent 14 years

LOC (6) Cl. 30 - *04*

U.S. Cl. D30—139



419,270

MAGNETIC HORSE BLANKET

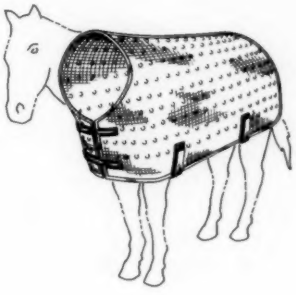
Ray S. Ruscitti, 465 W. Dominion Dr. #1504, Wood Dale, Ill. 60191

Filed Feb. 16, 1999, Appl. No. 100,634

Term of patent 14 years

LOC (6) Cl. 30 - *01*

U.S. Cl. D30—145



419,271

CANINE CANTEEN

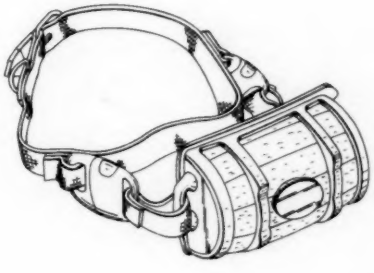
Mary Lou Camino, 8565 Ptarmigan Ct., and Susan J. Catalano, 8570 Ptarmigan Ct., both of Kirtland, Ohio 44094

Filed Feb. 8, 1999, Appl. No. 100,225

Term of patent 14 years

LOC (6) Cl. 30 - *09*

U.S. Cl. D30—152



419,272

APPARATUS FOR THE REMOVAL OF OIL OR GREASE FROM A LIQUID SURFACE

Martti Nordström, Loviisa, Finland, assignor to Oy LMP Patents Ltd AB, Loviisa, Finland

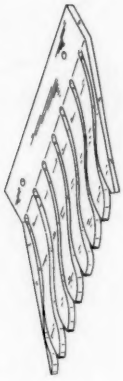
Filed Dec. 10, 1998, Appl. No. 97,645

Claims priority, application Finland, Jun. 10, 1998, M19980400; Jun. 10, 1998, M19980401

Term of patent 14 years

LOC (6) Cl. 15 - *05*

U.S. Cl. D32—25



419,273

SINK MAT

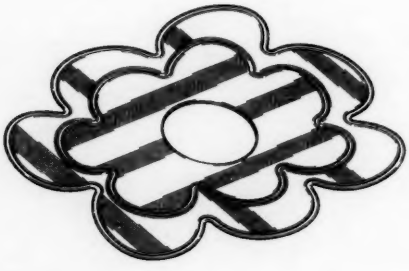
Nicole France, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jun. 9, 1999, Appl. No. 106,255

Term of patent 14 years

LOC (6) Cl. 07 - *05*

U.S. Cl. D32—57



419,274

ELECTRIC IRON

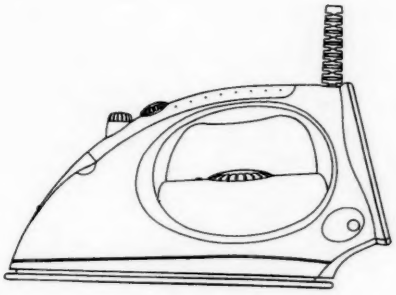
Lung Wai Choi, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Goodway Electrical Company Limited, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Sep. 29, 1998, Appl. No. 94,228

Term of patent 14 years

LOC (6) Cl. 07 - *05*

U.S. Cl. D32—70



419,275

PALLET

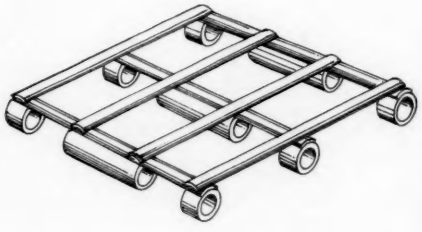
Leewood C. Carter, Ooltewah, Tenn., assignor to Reusable Rolls, Inc., Riceville, Tenn.

Filed Mar. 24, 1999, Appl. No. 102,398

Term of patent 14 years

LOC (6) Cl. 09 - *08*

U.S. Cl. D34—38



419,276

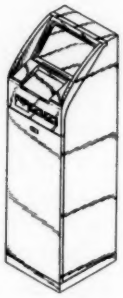
Patent Not Issued For This Number

419,277

CASHLESS AUTOMATIC TELLER MACHINE

Tsutomu Ishii, Tokyo; Hiroyuki Tanaka, Zama, and Koji Demizu, Atsugi, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Jan. 4, 1999, Appl. No. 98,663
Claims priority, application Japan, Jul. 2, 1998, 10-19129
Term of patent 14 years
LOC (6) Cl. 99 - *00*
U.S. Cl. D99—35



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TO WHOM

PATENTS WERE ISSUED ON THE 18th DAY OF JANUARY, 2000

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.C. Egerton Limited: *See—*
Escane, Richard, 6,015,312, Cl. 439-417.000.

AB Electrolux: *See—*
Fløysvik, Jan Egil, 6,014,867, Cl. 62-255.000.

ABB Patent GmbH: *See—*
Yakymyshyn, Christopher; Brubaker, Michael; Schwarz, Michael; Mendez, Alexis; and Ebbinghaus, Dirk, 6,016,053, Cl. 324-96.000.

Abbott Laboratories: *See—*
Bieniarz, Christopher; Huff, Jeffrey Bruce; and Henrard, Denis R., 6,015,902, Cl. 546-105.000.
Hackett, John R., Jr.; Hoff, Jane A.; Ostrow, David H.; and Golden, Alan M., 6,015,662, Cl. 435-5.000.
Mollison, Karl W., 6,015,815, Cl. 514-291.000.
Ross, Jeffrey R.; and Rowland, Kathleen, 6,015,400, Cl. 604-506.000.

Abe, Hideaki: *See—*
Tamura, Hideki; and Abe, Hideaki, 6,016,259, Cl. 363-20.000.

Abe, Hidetoshi, to 3M Innovative Properties Company. Adhesive-coated film. 6,015,606, Cl. 428-214.000.

Abe, Hiroshi: *See—*
Toukura, Nobusuke; Abe, Hiroshi; and Iwasaki, Yoshinori, 6,016,457, Cl. 701-70.000.

Abe, Naruaki: *See—*
Matsushita, Mitsumasa; Taniguchi, Takumi; Ohta, Takashi; Sato, Norio; Hoshino, Yuji; Kondo, Kanemitsu; Abe, Naruaki; and Suzuki, Toshiyuki, 6,015,856, Cl. 524-451.000.

Abe, Yoshito: *See—*
Oku, Teruo; Kayakiri, Hiroshi; Abe, Yoshito; Sawada, Yuki; and Mizutani, Tsuyoshi, 6,015,818, Cl. 514-312.000.

Abrahamson, Kathleen A.: *See—*
Nepsund, Larry R.; Abrahamson, Kathleen A.; Boeckermann, Thomas A.; and Elfstrand, James K., 6,015,452, Cl. 95-287.000.

Abrams, Jerome H.: *See—*
Hovland, Claire T.; Dixon, Roger; Knoll, L. Dean; and Abrams, Jerome H., 6,015,393, Cl. 600-587.000.

Abrams, Steven R.: *See—*
Oppenheim, Daniel P.; Abrams, Steven R.; Pazel, Donald P.; and Wright, James L., 6,015,949, Cl. 84-613.000.

Abrevaya, Hayim; and Vora, Bipin V., to UOP LLC. Process for removing polymeric by-products from acetylene hydrogenation product. 6,015,933, Cl. 585-810.000.

AC Properties B.V.: *See—*
Nichols, Mark Stewart, 6,016,486, Cl. 706-47.000.

Accu-Sort Systems, Inc.: *See—*
Hecht, Kurt; Neskovic, Milorad; Shreesha, Vasanth; and Cohen, Edward, 6,015,089, Cl. 235-462.160.

Accumulatorenwerke Hoppecke Carol Zoellner: *See—*
Nitsche, Werner; and Lahme, Norbert, 6,014,798, Cl. 29-2.000.

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Omori, Shigeru; and Kieffer, Jean Marie, 6,015,586, Cl. 427-11.000.

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Miura, Takeo, 6,016,565, Cl. 714-736.000.
Yoshida, Kenji, 6,016,566, Cl. 714-736.000.

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Yee, Albert G.; and Akeel, Hadi A., 6,016,385, Cl. 395-80.000.
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Clem, William E.; Williamson, Cory R.; and Albini, Martin, 6,015,368, Cl. 482-54.000.
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McDonald, Ian Alexander; Albrecht, Elisabeth; and Munoz, Benito, 6,015,879, Cl. 530-331.000.
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Lynch, David H.; and Alderson, Mark R., 6,015,559, Cl. 424-144.100.
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Gustafson, Kenneth, 6,014,945, Cl. 119-14.010.
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LeMire, Paul, 6,014,850, Cl. 53-134.100.
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Langford, Gordon B.; Montano, Cesar A.; Odom, Doug; Danielson, Thomas; Allen, Richard; Putnam, Greg; and Beck, David, 6,015,163, Cl. 280-735.000.
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Thummalapally, Damodar Reddy; and Ray, Abhijit, 6,016,270, Cl. 365-185.110.
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Leung, Roger Y.; and Nakano, Tadashi, 6,015,457, Cl. 106-287.160.
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Cerwin, Robert James; Transue, Deborah M.; and Alpern, Marvin, 6,015,042, Cl. 206-63.300.
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Hasegawa, Kazuo; and Takai, Daisuke, 6,016,018, Cl. 307-109.000.
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Chatterjee, Amitava; and Amerasekera, Ekanayake, 6,015,992, Cl. 257-350.000.
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Greenberg, N. Geoffrey, 6,014,854, Cl. 57-290.000.
American Cyanamid Company: *See—*
Hinman, Lois M.; and Hamann, Philip R., 6,015,562, Cl. 424-181.100.
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Zhu, Tianmin; and Lee, Hyuk-Koo, 6,015,809, Cl. 514-210.000.
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Raida, Hans-Joachim; and Bschorr, Oskar, 6,016,351, Cl. 381-77.000.
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Boyle, William J.; Lacey, David L.; Calzone, Frank J.; and Chang, Ming-Shi, 6,015,938, Cl. 800-18.000.
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Ross, David J.; Isaacs, Blake L.; and Williams, Kevin J., 6,016,423, Cl. 455-90.000.
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Analog Technologies, Inc.: *See—*
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Khafizov, Farid; Jain, Nikhil; and Anandampillai, Damodar, 6,016,429, Cl. 455-446.000.
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Koide, Hiromichi; Suzuki, Shinya; and Suzuki, Tatsuaki, 6,016,251, Cl. 361-699.000.
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Goto, Shinji; Saito, Jun; Ishii, Hiroyuki; Ando, Masao; Watanabe, Yoshiaki; Isoda, Yuzo; Tanoue, Masahide; and Inoue, Ryukichi, 6,016,412, Cl. 399-111.000.
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Plog, Carsten; Andorf, Renato; Mueller, Ralf; Schaefer, Wolfgang; and Kayser, Armin, 6,015,483, Cl. 205-763.000.
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Jain, Kanti; and Kling, Carl C., 6,014,845, Cl. 52-200.000.
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Applied Materials, Inc.: *See*—
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Van Autryve, Luc; and Lang, Stefan Oswald, 6,014,979, Cl. 134-1.100.
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Overholt, Trenton M.; Apps, William Patrick; and Koefelda, Gerald R., 6,015,056, Cl. 220-6.000.
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Williamson, Mark; and Davies, Derek, 6,015,101, Cl. 239-455.000.
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Lloyd, Lester John; Lloyd, Peter M.; Rubsamen, Reid M.; and Schuster, Jeffrey Arthur, 6,014,969, Cl. 128-200.140.
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Simons, F. Holmes; and Griffith, Ron L., 6,015,616, Cl. 428-364.000.

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Mali, James C.; and Becker, Scott T., 6,016,390, Cl. 395-500.180.

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Mizoshita, Yoshifumi; Yamada, Tomoyoshi; Kuroba, Yasumasa; Kouhei, Toru; Sugawara, Takao; Matsumoto, Masaru; Mase, Hiroyuki; Tsunekewa, Masao; Koganezawa, Shinji; and Aruga, Keiji, 6,016,237, Cl. 360-97.010.

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Yonetani, Masayuki; and Nishida, Seiji, 6,015,845, Cl. 523-130.000.

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Ewing, Kip A.; and George, Richard D., 6,015,184, Cl. 296-219.000.

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Durant, Gregory M.; and Rutledge, Christopher L., 6,016,212, Cl. 359-124.000.
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Kaplan, Alan Edward, 6,016,327, Cl. 375-243.000.
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Mifsud, Simon, 6,015,412, Cl. 606-83.000.

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Chang, I-Cheng, 6,016,216, Cl. 359-285.000.

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Wiklof, Christopher A.; and Austin, Pixie A., 6,015,241, Cl. 400-578.000.

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Gantt, Brian D., 6,016,147, Cl. 345-420.000.

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McAdams, Stephen R.; Edgar, Bradley L.; Martin, Richard J.; Kilgo, Marvin M.; Baer, Christopher B.; and Stilger, John D., 6,015,540, Cl. 423-659.000.

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Krishnamurthy, Sundram; Crawley, Michael William; Bailey, David Scott; and Pawlak, John Lawrence, 6,015,657, Cl. 430-554.000.

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Macleod, Allan; McCorry, Mark; and Falconer, Graeme, 6,015,014, Cl. 166-374.000.
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Cline, David J.; and Rosenau, Paul, 6,016,020, Cl. 307-125.000.

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Hilburn, Johnnie d., Jr., 6,014,848, Cl. 52-396.040.

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Xia, Changfeng; and Zhang, Yanwei, 6,015,464, Cl. 118-715.000.

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Kageyama, Yohei; Banba, Takeshi; and Kogure, Eikichi, 6,015,582, Cl. 426-392.000.

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Becker, Frederick F.; and Banik, Bimal K., 6,015,811, Cl. 514-227.500.

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Johnson, Clarence William, 6,015,134, Cl. 251-61.400.

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Swartz, Jerome; Barkan, Edward; Spitz, Glenn S.; Katz, Joseph; and Metlitsky, Boris, 6,015,090, Cl. 235-472.000.

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Crookham, Joe P.; Brackett, William E.; DeJong, Mark A.; and Barker, David L., 6,016,389, Cl. 395-500.010.

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Barry, Robert: *See—*
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Egging, Philip J.; Bartels, Brent A.; and Kappel, Gary W., 6,014,996, Cl. 144-334.000.

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Cook, C. Edgar; Kepler, John A.; Shetty, Rupa S.; Bartley, Gary S.; and Lee, David Yue-wei, 6,015,805, Cl. 514-176.000.

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Uto, Yoshitsugu, 6,014,938, Cl. 112-470.180.

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Schade, Christian; Wekel, Hans-Ulrich; Sanner, Axel; and Sperling, Karin, 6,015,551, Cl. 424-78.080.
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McNabb, Andrew J.; and Sink, R. Merritt, 6,015,445, Cl. 71-28.000.

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Grate, Jay W.; and Kaganove, Steven N., 6,015,869, Cl. 528-15.000.

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Baugh, Charles R.: *See—*
Foster, Robert B., Jr.; Baugh, Charles R.; and Schafer, David C., 6,016,313, Cl. 370-330.000.

Baughman, James; and Wheeler, Douglas J., to Teleflex Incorporated. Capacitive supercharger for electric shift mechanism. 6,016,049, Cl. 320-167.000.

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Fisher, Mark Robert; DeBraal, John Charles; Steffan, Guido; and Wenzl, Peter P., 6,015,771, Cl. 503-209.000.
Kiel, Wolfgang, 6,015,927, Cl. 568-362.000.
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Colin, Bruno; Jaravel, Cécile; and Cleuziat, Philippe, 6,015,531, Cl. 422-58.000.

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See, Jackie R.; and See, Darryl M., 6,015,576, Cl. 424-450.000.

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Golubev, Daniel B.; and Chaihorsky, Alexander, 6,015,566, Cl. 424-229.100.

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Kurtz, Robert J.; and Fuller, William D., 6,015,792, Cl. 514-19.000.

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Acker, David E., 6,016,439, Cl. 600-411.000.

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Levin, Gilbert V., 6,015,793, Cl. 514-23.000.

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van den Hurk, Jan; and Tijssen, Peter, 6,015,795, Cl. 514-44.000.

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Cormack, Donald; and Bircher, Keith, 6,015,229, Cl. 366-336.000.

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Rekstad, John; Bjerke, Bard; and Meir, Michaela, 6,014,967, Cl. 126-592.000.

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von der Osten, Claus; Cherry, Joel R.; Bjornvad, Mads E.; Vind, Jesper; and Rasmussen, Michael Dolberg, 6,015,783, Cl. 510-392.000.

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Lauterwald, Martin, 6,015,017, Cl. 173-48.000.
Webster, Craig, 6,014,812, Cl. 30-276.000.

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Becker, David S.; Blalock, Guy T.; and Roe, Fred L., 6,015,760, Cl. 438-714.000.

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Werp, Peter R.; Blume, Walter M.; Creighton, Francis M., IV; and Ritter, Rogers C., 6,015,414, Cl. 606-108.000.

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Martin, James L.; Sirjani, Abolfazl; Seppi, Kevin D.; and Keeler, Lisa S., 6,016,501, Cl. 707-203.000.

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Becker, Frederick F.; and Banik, Bimal K., 6,015,811, Cl. 514-227.500.

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Jargon, Jonathan David; Wenker, Paul Andrew; Fernalld, Kenneth Hudson; Bodmer, James Harold; and Paquet, David William, 6,016,240, Cl. 360-105.000.

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Nepsund, Larry R.; Abrahamson, Kathleen A.; Boeckermann, Thomas A.; and Elfstrand, James K., 6,015,452, Cl. 95-287.000.

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Lulay, Kenneth E.; and Kostenick, Paul G., 6,014,804, Cl. 29-715.000.

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Boudet, Alain; Pettenati, Jacqueline; Goffner, Deborah; Halpin, Claire; O'Connell, Ann; Romestant, Michel; Boerjan, Wout; and Leple, Jean-Charles, 6,015,943, Cl. 800-298.000.

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Bennett, C. Frank; Boggs, Russell T.; and Dean, Nicholas M., 6,015,892, Cl. 536-24.500.

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Hayes, Donald J.; Boldman, Michael T.; and Shah, Virang G., 6,015,083, Cl. 228-254.000.

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Llosas Bigorra, Joaquin; Bonastre Gilabert, Nuria; Osset Hernandez, Miguel; Closa Cruxens, Xavier; and Pi Subirana, Rafael, 6,015,780, Cl. 510-237.000.

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Rose, Timothy M.; Bosch, Marnix L.; and Strand, Kurt, 6,015,565, Cl. 424-229.100.

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Trifonov, Borislav Borisov; Roussev, Jeorge Konstantinov; and Boshev, Nikola Atanassov, 6,015,878, Cl. 530-329.000.

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Cruz, Jose M.; Bosnyak, Robert J.; and Drost, Robert J., 6,016,082, Cl. 331-117.0FE.

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Fortini, Paolo, 6,015,212, Cl. 351-92.000.

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Baioff, Danny; Tiessen, David A.; and Boucher, Gil, 6,015,095, Cl. 239-71.000.

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Schilling, Curtis L.; Burns, Patrick James; Ritscher, James Stephen; Bowman, Mark Paul; Childress, Thomas Edgeworth; Powell, Michael Ray; and Graban, Eric Michael, 6,015,920, Cl. 556-479.000.

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Failing, Bruce F, Jr.; Fernandez, Anthony P; Briechle, George T; Fenwick, Edward J; and Venable, Robert J, 6,016,481, Cl. 705-28.000.

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Lipkin, W. Ian; Briese, Thomas; Kliche, Stefanie; Schneider, Patrick A.; Stitz, Lothar; and Schneemann, Anette, 6,015,660, Cl. 435-5.000.

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Santi, John D., 6,014,808, Cl. 29-893.370.

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Baker, James R., Jr.; Wright, D. Craig; Hayes, Michael M.; Hamouda, Tarek; and Brisker, Joan, 6,015,832, Cl. 514-546.000.

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Freeman, Daniel Kenneth; Wong, Wing-Tak Kenneth; and Davis, Andrew Gordon, 6,016,468, Cl. 704-220.000.
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Kinoshita, Naohisa; and Imai, Koji, 6,015,211, Cl. 347-109.000.
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Berger, Bernd; and Brüggen, Franz, 6,014,882, Cl. 72-229.000.

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Buzak, Thomas S.; Ilcisin, Kevin J.; Martin, Paul C.; Den Biggelaar, Hans J. G. A.; Bruinink, Jacob; Bongaerts, Petrus Franciscus Gerardus; Burgmans, Adrianus Leonardus Josephus; Khan, Babar Ali; and Van Hellepute, Henri Roger Jules Richard, 6,016,032, Cl. 313-493.000.

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Simon, Arno; and Hartmann, Wilfried, 6,016,440, Cl. 600-473.000.

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Kleeman, Robert; and Liegeois, David D., 6,014,954, Cl. 123-339.130.

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Shen, Jerome L.; and Bryan, Barbara A., 6,015,785, Cl. 514-2.000.

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Raida, Hans-Joachim; and Bschorr, Oskar, 6,016,351, Cl. 381-77.000.

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Brown, Brian Hilton, 6,015,389, Cl. 600-533.000.

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Bugos, Robert C.: *See—*
Yamamoto, Harry Y.; Bugos, Robert C.; and Rockholm, David C., 6,015,939, Cl. 800-278.000.

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Castillo, Richard; Nair, Ravinder; Srinivasan, Krishna; and Villela, Edward C., 6,015,343, Cl. 454-365.000.

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Bula, Orest: *See—*
Neary, Timothy E.; Conrad, Edward W.; and Bula, Orest, 6,016,357, Cl. 382-144.000.

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Filanovsky, Boris; Burenko, Tat'yana; Kuselman, Ilya; Simantov, David; and Shenhar, Avinoam, 6,015,522, Cl. 264-105.000.

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Gusmeri, Val J.; Moses, John; and Burnison, Roger, 6,014,939, Cl. 114-230.120.

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Bogensberger, Erik F.; Burns, Matthew L.; and Rambo, Jeffery C., 6,016,121, Cl. 342-357.120.

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Colangelo, David W.; and Burns, Robert D., 6,015,217, Cl. 362-103.000.

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Kaminski, Mark S.; Butchko, Gregory M.; Glenn, Stephan D.; and Wahl, Richard L., 6,015,542, Cl. 424-1.490.

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Möller, Thorsten Jens; and Bütefisch, Karl-Aloys, 6,016,441, Cl. 600-477.000.

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Ray, Gary L.; Butler, Raymond S.; Buening, Dennis J.; Kobrehel, Michael D.; Cripe, Todd E.; Eichenberg, Paul M.; Eloian, Yasmin W.; Deperro, Charles A.; Czopek, Brian J.; and Inman, Mary M., 6,014,840, Cl. 49-413.000.

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Buhler, Joe P.; Butt, David; Goll, Jeffrey H.; Wagner, Neldon C.; and Whitney, Hartwell H., 6,015,383, Cl. 600-437.000.

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Mracna, Kellie; and Butterwegge, Hans, 6,015,399, Cl. 604-332.000.

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Elliott, Terrence Charles; Nevill, Gary John; Byrne, Ian Kenneth; Adams, Anthony Mason; Courtney, M Lyle; and Spencer, David, 6,015,248, Cl. 408-204.000.

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Brown, Patrick M.; Northrup, Michael C.; and Bakke, Bart F., 6,015,535, Cl. 423-179.000.
Streinz, Christopher C.; Neville, Matthew; Grumbine, Steven K.; and Mueller, Brian L., 6,015,506, Cl. 252-186.100.

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Harmon, Paul A.; Cabral-Lilly, Donna J.; Franklin, J. Craig; Reed, Robert A.; and Janoff, Andrew S., 6,015,716, Cl. 436-501.000.

Cachot, Maurice, to Wenger SA. Pocket tool magazine. 6,014,786, Cl. 7-118.000.

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Storm, Brian D.; Callicotte, Mark J.; and Cahill, Stephen V., 6,016,312, Cl. 370-311.000.

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Chatila, Ahmad; Yeh, Kuantai; Cleeves, James M.; Arnzen, Daniel; and Caldwell, Roger, 6,016,012, Cl. 257-775.000.

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Yamamoto, Harry Y.; Bugos, Robert C.; and Rockholm, David C., 6,015,939, Cl. 800-278.000.

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Cormack, Donald; and Bircher, Keith, 6,015,229, Cl. 366-336.000.

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Baldeschwieler, John D.; Gamble, Ronald C.; and Theriault, Thomas P., 6,015,880, Cl. 530-333.000.
Levy, Harold J.; and McGill, Thomas C., 6,015,738, Cl. 438-275.000.

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Renard, Pierre; Callebert, Olivier; and Dessapt, Jean Paul, 6,015,491, Cl. 210-198.200.

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Storm, Brian D.; Callicotte, Mark J.; and Cahill, Stephen V., 6,016,312, Cl. 370-311.000.

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Rolandi, Paolo; Gastaldi, Roberto; and Calligaro, Cristiano, 6,016,271, Cl. 365-185.180.

Callsen, Christian J.: *See*—
Cavanaugh, Ken M.; and Callsen, Christian J., 6,016,489, Cl. 707-8.000.

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Reddick, Mark S., 6,015,012, Cl. 166-313.000.

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Gerna, Danilo; Canegallo, Roberto; Chioffi, Ernestina; Pasotti, Marco; and Rolandi, Pier Luigi, 6,016,272, Cl. 365-185.210.

Cangiano, Dominick: *See*—
Kuder, James E.; Cangiano, Dominick; Provino, Vincent J.; and Xu, Wayne, 6,015,524, Cl. 264-173.120.

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Anayama, Hideki; Maruyama, Akio; and Nakamura, Kazushige, 6,016,414, Cl. 399-159.000.
Arai, Atsushi; and Fukazawa, Hideo, 6,015,203, Cl. 347-33.000.
Asakura, Osamu, 6,015,201, Cl. 347-19.000.
Chida, Makoto; Iwata, Kazuo; and Shimoda, Akiyoshi, 6,016,519, Cl. 710-19.000.
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Hashimoto, Kouji; Tsuchiya, Yoshiro; and Matsuda, Kenji, 6,016,408, Cl. 399-27.000.
Hiraike, Koou, 6,016,155, Cl. 345-468.000.
Hiramatsu, Soichi; and Aichi, Takao, 6,015,202, Cl. 347-32.000.
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Cowden, Gary L.; McGee, Brian G.; Puckett, Daniel R.; and Timmons, John P., 6,014,956, Cl. 123-446.000.
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Wang, Tao, 6,015,769, Cl. 502-331.000.
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Pollock, James S., Jr.; and Cembrola, Joan M., 6,016,453, Cl. 701-21.000.
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Muller, Ernst R.; Muller, Michael R.; and Cencich, Steve J., 6,015,228, Cl. 366-186.000.
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Kelleher, Judith A.; Maples, Kirk R.; and Zhang, Yong-Kang, 6,015,831, Cl. 514-445.000.
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Bernardon, Jean-Michel, 6,015,569, Cl. 424-401.000.
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Imbert, Daniel Henri Adrien; and Cessi, Jean-Louis, 6,014,814, Cl. 33-228.000.
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Golubev, Daniel B.; and Chaihorsky, Alexander, 6,015,566, Cl. 424-229.100.
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Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Gopal, Ajei Sarat; Kirby, Orvalle Theodore; Pershing, John Arthur, Jr.; Blount, Marion Lee; Kaplan, Marc Adam; and Turek, John Joseph Edward, 6,016,505, Cl. 709-205.000.
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Wulfman, Edward; Gordon, Lucas; Barry, Robert; Shuman, Brandon; Dillard, David; and Chandrasekaran, Verivada, 6,015,420, Cl. 606-168.000.
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Blonstein, Steve; Chaney, Jack; Gillespie, Donald; and Wood, Eric, 6,016,144, Cl. 345-342.000.
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Lo, Wing; and Chang, Jue, 6,016,124, Cl. 342-373.000.
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Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 6,015,904, Cl. 546-278.700.

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Letarte, Michelle; Massague, Joan; Bernabeu, Carmelo; and Cheifetz, Sela, 6,015,693, Cl. 435-69.100.

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Santilli, Donald S.; and Chen, Cong-Yan, 6,015,930, Cl. 585-320.000.

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Peterson, William M.; and Chen, Eugene Y., 6,016,269, Cl. 365-171.000.

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Scher, Herbert B.; and Chen, Jin Ling, 6,015,571, Cl. 424-408.000.

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Chen, Julian Zhiliang; Vrotsos, Thomas A.; and Chen, Wayne T., 6,016,002, Cl. 257-546.000.

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Yuan, Jun; and Chen, Xi, 6,015,900, Cl. 544-380.000.

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Adams, Laura Ellen; Chen, Young-Kai; and Nykolak, Gerald, 6,016,374, Cl. 385-24.000.

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von der Osten, Claus; Cherry, Joel R.; Bjornvad, Mads E.; Vind, Jesper; and Rasmussen, Michael Dolberg, 6,015,783, Cl. 510-392.000.

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Euvrard, Hubert; and Chevillot, Denis, 6,015,292, Cl. 433-102.000.

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Harrison, James J.; and Ruhe, William R., Jr., 6,015,776, Cl. 508-192.000.
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Lee, Chia-Chun; Chou, Ming-Hsun; Huang, Jui-Jung; and Chiang, Chih-Wen, 6,015,308, Cl. 439-155.000.

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Moroo, Jun; Mikami, Tomohisa; Mori, Masahiro; Chiba, Hirotaka; Nagata, Shigemi; Nakamura, Shigeyoshi; Konaka, Toshio; and Sato, Kazuhiko, 6,016,154, Cl. 345-442.000.

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Schilling, Curtis L.; Burns, Patrick James; Ritscher, James Stephen; Bowman, Mark Paul; Childress, Thomas Edgeworth; Powell, Michael Ray; and Graban, Eric Michael, 6,015,920, Cl. 556-479.000.

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Lee, Jack Y. B.; and Wong, Po C., 6,016,552, Cl. 714-6.000.

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Gerna, Danilo; Canegallo, Roberto; Chioffi, Ernestina; Pasotti, Marco; and Rolandi, Pier Luigi, 6,016,272, Cl. 365-185.210.

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Dubensky, Thomas W., Jr.; Polo, John M.; Chang, Steven M.W.; and Jolly, Douglas J., 6,015,694, Cl. 435-69.300.

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Dubensky, Thomas W., Jr.; Polo, John M.; Jolly, Douglas J.; and Driver, David A., 6,015,686, Cl. 435-69.100.

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Ohnishi, Noriyuki; Takeuchi, Hiroyuki; Miyazawa, Kazutoshi; Hachiya, Norihisa; and Nakagawa, Etsuo, 6,015,508, Cl. 252-299.630.
Tsujiyama, Yoshimi; Fujiwara, Toshikatsu; and Horiuchi, Shingo, 6,015,605, Cl. 428-195.000.

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Seong, Myung Je; Lee, Eun Jeong; and Cho, Yeong Wook, 6,016,558, Cl. 714-45.000.

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Jo, Sung Chil; and Choi, Bong Su, 6,016,218, Cl. 359-341.000.

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Kim, Hong-Ki; Lee, Duck-Hyung; and Choi, Chang-Sik, 6,015,748, Cl. 438-592.000.

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Shin, Tae Hwan; Kim, Jong Nam; Choi, Tae Sun; and Yoon, Il, 6,016,365, Cl. 382-233.000.

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Loosmore, Sheena; Harkness, Robin; Schryvers, Anthony; Chong, Pele; Gray-Owen, Scott; Yang, Yan-Ping; Murdin, Andrew; and Klein, Michel, 6,015,688, Cl. 435-69.100.

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Heyer, Thomas J. D.; Wandmacher, Robert A.; Chor, Lawrence C.; and Larson, John T., 6,015,629, Cl. 428-625.000.

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Lee, Chia-Chun; Chou, Ming-Hsun; Huang, Jui-Jung; and Chiang, Chih-Wen, 6,015,308, Cl. 439-155.000.

Chou, Winnie: *See—*
Molinari, Lou; Gooderum, Steve; Peckholdt, Keith; DiMarco, Frank; Jackson, Michael; DePoalo, Ron; Makhijani, Sunil; Chung, Jennifer; Chou, Winnie; and Gould, Mary Beth, 6,016,482, Cl. 705-35.000.

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Taylor, Rex E.; and Christopherson, Thomas W., 6,014,784, Cl. 5-713.000.

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Siverling, Todd D.; Chroninger, William Anthony; Chroninger, William Andrew; Gauss, Kreg T.; and Radzinski, William S., 6,015,494, Cl. 210-299.000.

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Siverling, Todd D.; Chroninger, William Anthony; Chroninger, William Andrew; Gauss, Kreg T.; and Radzinski, William S., 6,015,494, Cl. 210-299.000.

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Baioff, Danny; Tiessen, David A.; and Boucher, Gil, 6,015,095, Cl. 239-71.000.
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Klais, Matthew E., 6,014,908, Cl. 74-471.00R.
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Uhlig, Robert P.; and Fry, Cheryl A., 6,014,899, Cl. 73-664.000.

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Barton, Paul; Searle, Jeffrey Graham; Chrystie, Peter John; and Edwards, Keith Russell, 6,016,123, Cl. 342-373.000.

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Yano, Toshiyuki; Kojima, Hitoshi; Hiraoka, Eisuke; Chujo, Akihiko; Watanabe, Kaoru; Nagai, Hiromi; Endo, Yasuharu; and Hashimoto, Ken, 6,015,455, Cl. 106-31.580.

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Maugans, Rexford A.; Knickerbocker, Ed N.; Sawchuk, Rebecca J.; Whetten, Alan R.; Markovich, Ronald P.; and Chum, Pak-Wing S., 6,015,617, Cl. 428-364.000.

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Dubs, Paul; Martin, Roger; and Evans, Samuel, 6,015,899, Cl. 544-171.000.
Gugumus, François, 6,015,849, Cl. 524-100.000.
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Moore, Andrew J., 6,015,239, Cl. 385-92.000.

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Krantz, Jeffrey Isaac; Bloomfield, Marc Alan; and Luu, Thanh, 6,016,535, Cl. 711-171.000.

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Kafka, James; Newell, Vincent J.; Watts, Michael; and Clark, James, 6,016,323, Cl. 372-20.000.

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Roslund, Richard N., Jr.; Nelson, Patrick; Wilkerson, Larry Allen; Roark, Troy; Dral, Joel; Simpson, Steve; and Clark, John, 6,015,187, Cl. 297-300.400.

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Hoffman, Joe G.; and Clark, R. Scot, 6,015,477, Cl. 203-13.000.

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Popoff, Peter; Hodgkins, David H.; Clausen, Michael D.; and Oelschlaegel, Victor R., 6,015,492, Cl. 210-238.000.

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Schaeffer, James Robert; Mauck, John Charles; Winterkorn, Robert Francis; and Arter, Thomas Charles, 6,015,683, Cl. 435-24.000.

Cloarec, Alix: *See—*
Camborde, Francoise; Cloarec, Alix; Gungor, Timur; and Teulon, Jean-Marie, 6,015,797, Cl. 514-46.000.

Closa Cruxens, Xavier: *See—*
Llosas Bigorra, Joaquin; Bonastre Gilabert, Nuria; Osset Hernandez, Miguel; Closa Cruxens, Xavier; and Pi Subirana, Rafael, 6,015,780, Cl. 510-237.000.

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Wesley, Ronald D.; Clouser, Deborah F.; Mengeling, William L.; Andreyev, Vladimir G.; Vorwald, Ann C.; and Lager, Kelly M., 6,015,663, Cl. 435-5.000.

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Kensey, Kenneth; and Clupper, Harold, 6,015,386, Cl. 600-486.000.

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Hecht, Kurt; Neskovic, Milorad; Shreesha, Vasanth; and Cohen, Edward, 6,015,089, Cl. 235-462.160.

Colangelo, David W.; and Burns, Robert D. Uniform epaulet-coupled emergency flashlight. 6,015,217, Cl. 362-103.000.

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Rockstein, George B.; Wilz, David M.; Colavito, Stephen J.; German, Gene; and Knowles, Carl Harry, 6,015,091, Cl. 235-472.010.

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Bally, Alexander; and Colburn, Eric R., 6,014,917, Cl. 81-355.000.

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Ogilvie, Gregory K.; Davenport, Deborah J.; Gross, Kathy L.; and Hand, Michael S., 6,015,798, Cl. 514-57.000.

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Mueller, George G.; and Lys, Ihor A., 6,016,038, Cl. 315-291.000.

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Benfante, Dennis J., 6,015,314, Cl. 439-517.000.

Colston, Billy W., Jr.: *See—*
Nathel, Howard; Cartland, Harry E.; Colston, Billy W., Jr.; Everett, Matthew J.; and Roe, Jeffery N., 6,015,969, Cl. 250-227.270.

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Heenan, Sidney A.; Montalbano, Anthony J.; Coman, Liviu A.; and Couzin, Dennis I., 6,015,214, Cl. 359-529.000.

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Fiora, Aldo, 6,014,909, Cl. 74-490.020.

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Courel, Jean-Marie; Schruoffeneger, Denis; and Solignac, Serge, 6,015,468, Cl. 156-129.000.
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Lee, Chia-Chun; Chou, Ming-Hsun; Huang, Jui-Jung; and Chiang, Chih-Wen, 6,015,308, Cl. 439-155.000.
Compaq Computer Corporation: *See*—
Kim, Thomas Dongsuk; Hawthorne, Seth Gordon; and Kosinski, Joseph Stanley, 6,016,474, Cl. 705-1.000.
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Bernier, Donald R.; Fraser, Stephen G.; and Juengel, Richard O., 6,015,037, Cl. 194-318.000.
Compuware Corporation: *See*—
Guinther, Thomas; and Austin, James, 6,016,466, Cl. 702-187.000.
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Kirks, Kelly, 6,014,891, Cl. 73-40.000.
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Frimm, Fernando C.; Knecht, Harris I.; and Condon, Thomas D., 6,015,245, Cl. 405-200.000.
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Clem, William E.; Williamson, Cory R.; and Albini, Martin, 6,015,368, Cl. 482-54.000.
ConLinCo., Inc.: *See*—
Sæbø, Asgeir; and Skarie, Carl, 6,015,833, Cl. 514-558.000.
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Loosmore, Sheena; Harkness, Robin; Schryvers, Anthony; Chong, Pele; Gray-Owen, Scott; Yang, Yan-Ping; Murdin, Andrew; and Klein, Michel, 6,015,688, Cl. 435-69.100.
Connect One, Inc.: *See*—
Kaplan, Allen D.; and McCarthy, William F., 6,016,307, Cl. 370-238.000.
Connell, Charles R.: *See*—
Woudenberg, Timothy M.; Bodner, Kevin S.; Connell, Charles R.; Shigeura, John; Tracy, David H.; and Young, Eugene F., 6,015,674, Cl. 435-6.000.
Connelly, Martin P. Multi-purpose convertible garment with adjustable side vents. 6,014,772, Cl. 2-69.000.
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Vinson, Phillip Kyle; Foley, Peter Robert; Cripe, Thomas Anthony; Connor, Daniel Stedman; and Willman, Kenneth William, 6,015,781, Cl. 510-302.000.
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Neary, Timothy E.; Conrad, Edward W.; and Bula, Orest, 6,016,357, Cl. 382-144.000.
Conrow, Raymond E., to Alcon Laboratories, Inc. N-alkyl-N-alkoxycarboxamides and methods of use in prostaglandin synthesis. 6,015,922, Cl. 560-312.000.
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Consoli, John Joseph: *See*—
Benjamin, Karen Elizabeth; and Consoli, John Joseph, 6,015,311, Cl. 439-267.000.
Contolini, Matteo: *See*—
Kuhn, Roland; Junqua, Jean-Claude; and Contolini, Matteo, 6,016,471, Cl. 704-266.000.
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Convertidora Industrial S.A. DE C.V.: *See*—
Garcia, Arturo Verduzco, 6,015,472, Cl. 156-290.000.
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Malone, Hugh Robert; Dendy, Deborah Sue; Cook, Dean Lawrence; Phillips, James R.; and Kommrusch, Richard S., 6,016,122, Cl. 342-372.000.
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Cooper, James Nicholas: *See*—
Cassels, Ian; and Cooper, James Nicholas, 6,015,006, Cl. 164-416.000.
Cooper, Leon: *See*—
Wantz, James C.; and Cooper, Leon, 6,015,230, Cl. 374-1.000.
Cooper, Mark: *See*—
Reed, David B.; Cooper, Mark; Rosink, Kenneth E.; and Ziaja, Henry J., 6,014,893, Cl. 73-49.700.
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Rakos, Ronald; Lund, Signe Mary; and Tomonto, Charles V., 6,015,432, Cl. 623-1.000.
Corey, David R.: *See*—
Shay, Jerry W.; Wright, Woodring E.; Piatyszek, Mieczyslaw A.; Corey, David R.; and Norton, James C., 6,015,710, Cl. 435-375.000.
Corley, Neil C.: *See*—
Lal, Preeti; Hillman, Jennifer L.; and Corley, Neil C., 6,015,702, Cl. 435-193.000.
Yue, Henry; Corley, Neil C.; and Lal, Preeti, 6,015,672, Cl. 435-6.000.
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Violette, John A.; Soule, Matthew C.; and Corley, Thomas G., 6,015,264, Cl. 416-146.00A.
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Gyorkos, Albert; and Spruce, Lyle W., 6,015,791, Cl. 514-18.000.
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Gottlieb, Robert Steven; and Corwin, Michael Paul, 6,016,542, Cl. 712-225.000.
Cosco, Inc.: *See*—
Cone, Richard E., II, 6,014,781, Cl. 5-99.100.
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Jaekel, Fred G.; Horton, Frank A.; and Lee, Arthur L., 6,014,879, Cl. 72-61.000.
Costanzo, Patricia M.: *See*—
Kostyniak, Paul J.; Giese, Rossman F.; Costanzo, Patricia M.; and Syracuse, Joseph A., 6,015,816, Cl. 514-299.000.
Costello, Christine Ann: *See*—
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Kaminski, Mark S.; Butchko, Gregory M.; Glenn, Stephan D.; and Wahl, Richard L., 6,015,542, Cl. 424-1.490.
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Patil, Shamrao Ganpatrao; Patil, Bhaskar Ganpatrao; Gokhale, Digambar Vitthal; Bastawde, Kulbhushan Balwant; Puntambekar, Ulka Shrirang; and Ranjekar, Prabhakar Kamalakar, 6,015,699, Cl. 435-161.000.
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Courtney, M Lyle: *See*—
Elliott, Terrence Charles; Nevill, Gary John; Byrne, Ian Kenneth; Adams, Anthony Mason; Courtney, M Lyle; and Spencer, David, 6,015,248, Cl. 408-204.000.
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Heenan, Sidney A.; Montalbano, Anthony J.; Coman, Liviu A.; and Couzin, Dennis I., 6,015,214, Cl. 359-529.000.
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Roohparvar, Fariborz F.; Mowlavi, Allahyar Vahidi; Hawes, Mark A.; and Cowan, Gregory L., 6,016,561, Cl. 714-720.000.
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Cowsert, Lex M.: *See*—
Monia, Brett P.; Baker, Brenda F.; Zhang, Hong; and Cowsert, Lex M., 6,015,712, Cl. 435-375.000.
Cox, Arthur Leo, to Advanced Micro Devices, Inc. Method and system for trapping contaminants formed during chemical vapor deposition processing of semiconductor wafers. 6,015,463, Cl. 118-715.000.
Cox, Brian J.: *See*—
Rosenbluth, Robert F.; Cox, Brian J.; and Greene, George R., Jr., 6,015,424, Cl. 606-200.000.
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Stefanchik, David; Hamann, David L.; Flege, John B., Jr.; Ladd, Douglas N.; Lupton, J. Renee; and Craft, James A., 6,015,416, Cl. 606-144.000.

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Krishnamurthy, Sundram; Crawley, Michael William; Bailey, David Scott; and Pawlak, John Lawrence, 6,015,657, Cl. 430-554.000.

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Creative Labs, Inc.: *See*—
Rossum, David P., 6,016,522, Cl. 710-52.000.

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Hanners, John C., 6,016,250, Cl. 361-695.000.

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Werp, Peter R.; Blume, Walter M.; Creighton, Francis M., IV; and Ritter, Rogers C., 6,015,414, Cl. 606-108.000.

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Bansal, Pradeep K.; Begeja, Lee; and Creswell, Carroll W., 6,016,338, Cl. 379-93.130.

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Ray, Gary L.; Butler, Raymond S.; Buening, Dennis J.; Kobrehel, Michael D.; Cripe, Todd E.; Eichenberg, Paul M.; Eloian, Yasmin W.; Deperro, Charles A.; Czopek, Brian J.; and Inman, Mary M., 6,014,840, Cl. 49-413.000.

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Barto, Robert M., Jr.; and Lopata, Ira L., 6,015,070, Cl. 223-46.000.

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Olivier, André W.; Ragan, Bryant G.; and Cronvich, James T., 6,016,286, Cl. 367-17.000.

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Smith, David A.; and Crutcher, John D., 6,014,790, Cl. 15-304.000.

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Krebs, Arthur T.; and Stockley, H. Walker, 6,015,583, Cl. 426-396.000.

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Vandenboom, Robert M.; Poole, David L.; Steinbrunner, Steven L.; and Seffernick, Lewis L., 6,014,900, Cl. 73-781.000.
Vaughn, Gary, 6,016,052, Cl. 323-355.000.

Cuddy, Christopher: *See*—
Stone, Michael George; and Cuddy, Christopher, 6,015,057, Cl. 220-9.200.

Culliton, Stephen P.: *See*—
Thompson, Raymon F.; Berner, Robert W.; Curtis, Gary L.; Culliton, Stephen P.; and Wright, Blaine G., 6,014,817, Cl. 34-60.000.

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Cummins Engine Company, Inc.: *See*—
Thomas, Mark G.; Lannan, Ronald B.; and Federle, Kenneth R., 6,016,045, Cl. 320-107.000.

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Griffin, Roger John; Calvert, Alan Hilary; Curtin, Nicola Jane; Newell, David Richard; and Golding, Bernard Thomas, 6,015,827, Cl. 514-394.000.

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Thompson, Raymon F.; Berner, Robert W.; Curtis, Gary L.; Culliton, Stephen P.; and Wright, Blaine G., 6,014,817, Cl. 34-60.000.

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Krairmer, Amy L.; Pockat, Gregory; and Wohlert, David, 6,015,235, Cl. 383-109.000.

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Krag, David N., 6,015,390, Cl. 600-549.000.

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Craig, Alan Robert; Reidy, Michael Patrick; and Wang, Chengrong, 6,015,480, Cl. 204-418.000.

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Hopkins, John A.; Schwartz, Frederick A.; McCay, Mary Helen; McCay, Thurman Dwayne; Dahotre, Narendra B.; and Bible, John Brice, 6,016,227, Cl. 359-668.000.

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Spies, Hans; and Daxer, Horst, 6,015,162, Cl. 280-735.000.
Vogel, Thomas; and Thurner, Thomas, 6,015,193, Cl. 303-147.000.

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Wright, James R., Jr.; and Pohajdak, Bill, 6,015,713, Cl. 435-378.000.

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Bolan, Michael L.; and Fekete, Nicholas M. G., 6,016,255, Cl. 361-807.000.

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Breese, Douglas E., 6,015,350, Cl. 464-162.000.

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Daniele, Robert A.; Esteves, Anthony; Reinemuth, George Horst; and Branco, Richard Paul, to Ethicon, Inc. Package feed arrangement in a machine for the automated packaging of needles and attached sutures. 6,014,851, Cl. 53-430.000.

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Duddu, Raja G.; and Dave, Paritosh R., 6,015,898, Cl. 540-554.000.

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Davis, Bruce L.: *See*—
Knudson, Edward B.; Ellis, Michael D.; Thomas, William L.; and Davis, Bruce L., 6,016,141, Cl. 345-327.000.

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Jacobsen, Stephen C.; and Davis, Clark, 6,014,919, Cl. 83-282.000.

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Cassels, Ian; and Cooper, James Nicholas, 6,015,006, Cl. 164-416.000.

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Bachmann, Henry C.; Cook, Steven T.; Schubert, James R.; Schubert, John F.; and Strong, Lori E., 6,015,062, Cl. 220-295.000.

De, Biswanath: *See*—
Wang, Zhe; Almstead, Neil Gregory; Bradley, Rimma Sandler; Natchus, Michael George; De, Biswanath; Pikul, Stanislaw; and Taiwo, Yetunde Olabisi, 6,015,912, Cl. 548-408.000.

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Burberry, Mitchell S.; DeBoer, Charles D.; and Harris, Mark A., 6,014,930, Cl. 101-456.000.

DeBoer, Jon A., Jr.: *See*—
McGourthy, John D., Jr.; and DeBoer, Jon A., Jr., 6,015,032, Cl. 192-14.000.

DeBoer, Scott: *See*—
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Fisher, Mark Robert; DeBraal, John Charles; Steffan, Guido; and Wenzl, Peter P., 6,015,771, Cl. 503-209.000.

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Durchenwald, Larry Don, 6,015,005, Cl. 164-170.000.

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Girvin, Kenneth L.; and DeFreez, Richard K., 6,016,194, Cl. 356-337.000.

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Ahlquist, Louis Nelson; and Degani, Yinon, 6,015,652, Cl. 430-315.000.

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Blatter, Harold; Horlander, Thomas Edward; Bridgewater, Kevin Elliott; and Deiss, Michael Scott, 6,016,348, Cl. 380-5.000.

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Mathis, Roland, 6,015,363, Cl. 475-281.000.

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Van Vlasselaer, Peter; and Hasan, Shirin W., 6,015,843, Cl. 522-84.000.

Dendy, Deborah Sue: *See*—
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Denninger, Uwe: *See*—
Langstein, Gerhard; Bohnenpoll, Martin; Denninger, Uwe; Obrecht, Werner; and Plesch, Peter, 6,015,841, Cl. 522-29.000.

Dennis, Richard D., to Carrier Corporation. Louver apparatus for air conditioning unit. 6,015,342, Cl. 454-316.000.

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Ray, Gary L.; Butler, Raymond S.; Buening, Dennis J.; Kobrehel, Michael D.; Cripe, Todd E.; Eichenberg, Paul M.; Eloian, Yasmin W.; Deperro, Charles A.; Czopek, Brian J.; and Inman, Mary M., 6,014,840, Cl. 49-413.000.

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Bergmann, Ernest Eisenhardt; and Derkits, Gustav Edward, Jr., 6,015,998, Cl. 257-446.000.

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Butts, Lawrence D.; Robinson, Charles L.; Simpson, Douglas; and Dery, Joseph L., 6,015,302, Cl. 439-76.200.

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Mathieu, Gérard; and Desertot, Didier, 6,015,084, Cl. 229-122.320.

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Renard, Pierre; Callebert, Olivier; and Dessapt, Jean Paul, 6,015,491, Cl. 210-198.200.

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Möller, Thorsten Jens; and Bütefisch, Karl-Aloys, 6,016,441, Cl. 600-477.000.

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Hochuli, Martin; and Dietrich, Robert, 6,015,954, Cl. 174-110.00R.

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Burrows, Michael, 6,016,493, Cl. 707-101.000.
Kang, Sing Bing; and Waters, Keith, 6,016,148, Cl. 345-425.000.
Newsted, Gary Michael; and Ryen, Richard Eugene, 6,016,467, Cl. 704-9.000.
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Genna, Sebastian, 6,015,974, Cl. 250-368.000.

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Vrijbloed, Jan W.; and Dijkhuizen, Lubbert, 6,015,705, Cl. 435-252.100.

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Crandall, Charles M., 6,016,173, Cl. 349-25.000.

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Farber, Gennady; and Jabr, Salim, 6,016,213, Cl. 359-177.000.

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Hovland, Claire T.; Dixon, Roger; Knoll, L. Dean; and Abrams, Jerome H., 6,015,393, Cl. 600-587.000.

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Kyle, Robert R.; Dixon, William F.; and Meyer, Ronald L., 6,016,304, Cl. 370-206.000.

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Bakke, Stephen Peter; Lovin, William R.; Dobyns, Patrick E.; and Martindale, John, 6,016,498, Cl. 707-103.000.

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Jimenez, Juan M.; Worley, A. Justine; Dodge, Charles W.; and Tribolet, David C., 6,015,143, Cl. 271-4.100.

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Lapatovich, Walter P.; Doell, Gerhard W.; and Smith, Robert K., 6,016,031, Cl. 313-493.000.

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Bisagni, Emile; Dolle, Valérie; Nguyen, Chi Hung; Legraverend, Michel; Aubertin, Anne-Marie; Kirn, André; Andreola, Marie-Line; Tarrago-Litvak, Laura; and Ventura, Michel, 6,015,820, Cl. 514-348.000.

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Bischoff, Thomas C.; Dollimer, Michael R.; and Eastman, William J., 6,016,436, Cl. 600-374.000.

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Nepsund, Larry R.; Abrahamson, Kathleen A.; Boeckermann, Thomas A.; and Elfstrand, James K., 6,015,452, Cl. 95-287.000.

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Bronicki, Lucien Y.; Sinai, Joseph; Doron, Benjamin; and Kaplan, Uri, 6,014,856, Cl. 60-39.120.

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Jones, Charlie E.; Kazakis, Michael V.; and Dossaji, Murtaza R., 6,014,820, Cl. 34-548.000.

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Vlasblom, Jack T., 6,015,763, Cl. 442-123.000.

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Mehta, Rajendra; Doll, Gary; Dotson, Mark; Lakes, A. Dale; and Shields, Rick L., 6,015,589, Cl. 427-152.000.

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Douglas, Stephen Joseph: *See*—
Finsterwald, P. Michael; Douglas, Stephen Joseph; and Just, Ricky Gail, 6,014,898, Cl. 73-642.000.

Douglass, Karl J. Walker formed substantially from a polymer. 6,014,981, Cl. 135-67.000.

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Fahl, Richard L., 6,015,168, Cl. 285-81.000.

Dow AgroSciences LLC: *See*—
Siddall, Thomas L.; Emonds, Mark V. M.; Krumel, Karl L.; Schomaker, Jennifer M.; and Zettler, Mark W., 6,015,911, Cl. 548-369.400.

Dow Chemical Company, The: *See*—

Maugans, Rexford A.; Knickerbocker, Ed N.; Sawchuk, Rebecca J.; Whetten, Alan R.; Markovich, Ronald P.; and Chum, Pak-Wing S., 6,015,617, Cl. 428-364.000.
Nickias, Peter N.; McAdon, Mark H.; Patton, Jasson T.; Friedrichsen, Bernard P.; Soto, Jorge; Stevens, James C.; and VanderLende, Daniel D., 6,015,868, Cl. 526-127.000.

Dow Corning Corporation: *See—*
Gornowicz, Gerald Alphonse, 6,015,858, Cl. 524-545.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Vlahovic, Josip, 6,015,183, Cl. 296-204.000.

Draetta, Giulio: *See—*
Gyuris, Jeno; Lamphere, Lou; and Draetta, Giulio, 6,015,692, Cl. 435-69.100.

Drake, Charles A.: *See—*
Wu, An-hsiang; and Drake, Charles A., 6,015,931, Cl. 585-649.000.

Dral, Joel: *See—*
Roslund, Richard N., Jr.; Nelson, Patrick; Wilkerson, Larry Allen; Roark, Troy; Dral, Joel; Simpson, Steve; and Clark, John, 6,015,187, Cl. 297-300.400.

Dream World Design: *See—*
Stevenson, Anna, 6,014,782, Cl. 5-499.000.

Dreher, Mark R.: *See—*
Rittmueller, Stephen P.; Annerino, Frank J.; Dreher, Mark R.; and Chastain, Scott A., 6,016,346, Cl. 379-420.000.

Drerup, Josefina Santiago: *See—*
Capps, Louis Bennie, Jr.; Dixon, Robert Christopher; Drerup, Josefina Santiago; and Nguyen, Thoi, 6,016,517, Cl. 710-1.000.

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Drost, Robert J.: *See—*
Cruz, Jose M.; Bosnyak, Robert J.; and Drost, Robert J., 6,016,082, Cl. 331-117.0FE.

Drozd, Steven: *See—*
Davey, Martha; and Drozd, Steven, 6,014,774, Cl. 2-158.000.

Drucker, Elliott: *See—*
Anderson, Thomas B.; Drucker, Elliott; and Robinson, John Dennis, 6,015,451, Cl. 95-184.000.

Drum Workshop, Inc.: *See—*
Lombardi, Donald G., 6,015,128, Cl. 248-421.000.

Dry, Nathan M.: *See—*
Tucci, Raymond J.; and Dry, Nathan M., 6,015,570, Cl. 424-403.000.

DSM N. V.: *See—*
Burke, Patrick Michael, 6,015,923, Cl. 562-519.000.

Du Pont de Nemours, E. I., and Company: *See—*
Burke, Patrick Michael, 6,015,923, Cl. 562-519.000.
Daly, Thomas Patrick; Koskol, Joseph Edward; Madigan, Kevin Robert; Takagi, Jun; and Yamauchi, Naofumi, 6,015,113, Cl. 242-474.500.
Jacobson, Howard Wayne; and Kasowski, Robert Valentine, 6,015,510, Cl. 252-609.000.
Wysong, Robert David; Beestman, George Bernard; and Schurr, George Alan, 6,015,773, Cl. 504-116.000.

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Ducey, Lawrence E., to Potomac Rain Room, Inc. Method and apparatus for spraying pressurized water. 6,015,099, Cl. 239-266.000.

Duchon, Brent G.: *See—*
Douglas, Joel S.; Roe, Jeffrey N.; Radwanski, Ryszard; and Duchon, Brent G., 6,015,392, Cl. 600-583.000.

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Shirley, Brian M.; Casper, Stephen L.; Lowrey, Tyler A.; and Duesman, Kevin G., 6,015,729, Cl. 438-239.000.

Dufour, Jean-Pierre Ghislain: *See—*
Jamil, Said; Dufour, Jean-Pierre Ghislain; and Deffense, Etienne Marie Joseph, 6,015,915, Cl. 554-184.000.

Dukart, Anton: *See—*
Dobler, Klaus; Zabler, Erich; Dukart, Anton; and Herrmann, Thomas, 6,016,104, Cl. 340-646.000.

Dura Automotive Systems, Inc.: *See—*
Ray, Gary L.; Butler, Raymond S.; Buening, Dennis J.; Kobrehel, Michael D.; Cripe, Todd E.; Eichenberg, Paul M.; Eloian, Yasmin W.; Deperro, Charles A.; Czopek, Brian J.; and Inman, Mary M., 6,014,840, Cl. 49-413.000.

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Durchenwald, Larry Don, to Deere Company. Respective inflatable arbors for making backdraft cavity in sand core and for forming part of core lift device insertable in cavity. 6,015,005, Cl. 164-170.000.

Durham, James W. Multiplex system for maintaining of product temperature in a vehicular distribution process. 6,014,866, Cl. 62-201.000.

Duvert, Patrice, to Rhone-Poulenc Agrochimie. Synergistic fungicidal composition comprising a compound analogous to strobilurin. 6,015,802, Cl. 514-141.000.

Dwyer, Patrick E.: *See—*
Hong, Keith C.; Dwyer, Patrick E.; Keil, Elinor B.; Lambert, Edward; and Aspi, Fershid, 6,015,338, Cl. 451-541.000.

Dykstal, Gregory L.: *See—*
Slater, Byron J.; Voisine, John T.; and Dykstal, Gregory L., 6,016,054, Cl. 324-142.000.

Dynex Technologies, Inc.: *See—*
Taylor, Walter W., 6,016,192, Cl. 356-229.000.

Dystar Textilefarben GmbH & Co.: *See—*
Pedemonte, Ron; and Stroben, Andreas, 6,015,439, Cl. 8-549.000.

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Dzwonnek, Siegfried: *See—*
Hagemann, Jörg; and Dzwonnek, Siegfried, 6,015,654, Cl. 430-504.000.

E.O. Schweitzer Manufacturing Co., Inc.: *See—*
Schweitzer, Edmund O., Jr., 6,016,105, Cl. 340-664.000.

Eagle Natural Stone: *See—*
Jurek, Waldemar Robert; and Puchalski, Arthur, 6,014,780, Cl. 4-613.000.

Eagle-Picher Industries, Inc.: *See—*
Davidson, Chris R., 6,016,048, Cl. 320-153.000.

Eakins, Richard: *See—*
Broadhead, Douglas; Eakins, Richard; Cimachowski, Czeslaw; Bentley, Brian; Krommenhoek, Joe; Ma, Son; Harding, David; and Pang, Nelson, 6,015,189, Cl. 297-353.000.

Earle, Kent L.; and Lauriano, Greg L., to Etcon Corporation. Portable tubing cutter. 6,014,810, Cl. 30-92.000.

Eastern Acoustic Works, Inc.: *See—*
Gunness, David W., 6,016,353, Cl. 381-342.000.

Eastman Kodak Company: *See—*
Aslam, Muhammed; Wu, Fangsheng; and Bobo, Robert D., 6,016,410, Cl. 399-69.000.
Burns, Elizabeth G.; Lawrence, Kristine B.; Bowman, Wayne A.; and Yau, Hwei-Ling, 6,015,772, Cl. 503-227.000.
DiRisio, Anthony, 6,016,404, Cl. 396-6.000.
Herrick, Diane M.; Tombs, Thomas N.; and Ziegelmuller, Frank L., 6,016,415, Cl. 399-162.000.
Krishnamurthy, Sundram; Crawley, Michael William; Bailey, David Scott; and Pawlak, John Lawrence, 6,015,657, Cl. 430-554.000.
Lungershausen, Arnold W., 6,016,406, Cl. 396-200.000.
Raes, Camiel J.; Stagnitto, Joseph E.; and White, James A., 6,015,174, Cl. 294-2.000.
Stephenson, Stanley W., 6,016,157, Cl. 347-239.000.
Welter, Thomas R.; and Reynolds, James H., 6,015,658, Cl. 430-557.000.

Eastman, William J.: *See—*
Bischoff, Thomas C.; Dollimer, Michael R.; and Eastman, William J., 6,016,436, Cl. 600-374.000.

Eaton Corporation: *See—*
Brailove, Adam A., 6,016,036, Cl. 315-111.710.
Craft, Robert B.; Steurer, John S.; and Peterson, Paul R., 6,015,444, Cl. 55-320.000.
DeLand, Daniel L., 6,015,133, Cl. 251-30.010.
Fortune, G. Clark; Waraksa, Thomas J.; Spring, James K.; and Prainito, John D., 6,016,102, Cl. 340-442.000.
Gardner, David J., 6,016,097, Cl. 338-47.000.
Markyvech, Ronald K.; Genise, Thomas A.; and McReynolds, James R., 6,015,366, Cl. 477-109.000.
Slepian, Robert Michael; Farrow, William Christopher; Little, Michael Thomas; Beck, H. Richard; Eberts, William George; and Turner, David Curtis, 6,015,959, Cl. 200-400.000.

Eaton, Gerald B.; Monahan, Michael J.; and Tipton, Robert J., to Energy & Environmental International, L.C. Methods for forming amorphous ultra-high molecular weight polyalphaolefin drag reducing agents. 6,015,779, Cl. 508-591.000.

Ebara Corporation: *See—*
Hatakeyama, Masahiro; Ichiki, Katsunori; Kato, Takao; Hatamura, Yotaro; and Nakao, Masayuki, 6,015,976, Cl. 250-492.230.
Hiyama, Hirokuni; and Wada, Yutaka, 6,015,337, Cl. 451-288.000.
Katsukura, Noboru; Yamada, Takehiko; and Tochikubo, Eiji, 6,015,490, Cl. 210-151.000.

Ebbinghaus, Dirk: *See—*
Yakymyshyn, Christopher; Brubaker, Michael; Schwarz, Michael; Mendez, Alexis; and Ebbinghaus, Dirk, 6,016,053, Cl. 324-96.000.

Eberspächer, Helmut; Gauch, Winfried Hardy; Haf, Helmut; and Robel, Wolfgang, to Reitter & Schefenacker GmbH & Co. KG. Light assembly, preferably tail light assembly, of a vehicle, preferably a motor vehicle. 6,016,035, Cl. 315-82.000.

Eberts, William George: *See—*
Slepian, Robert Michael; Farrow, William Christopher; Little, Michael Thomas; Beck, H. Richard; Eberts, William George; and Turner, David Curtis, 6,015,959, Cl. 200-400.000.

Ebihara, Fukuji: *See—*
Kazuta, Takashi; and Ebihara, Fukuji, 6,015,784, Cl. 510-446.000.

Ebiko, Hirotoshi: *See*—
Tosaka, Shigeru; Tachizaki, Syuji; Sato, Kouetu; Takahashi, Yoshihiro; Kimura, Hiroshi; Tajima, Hiroshi; Susukida, Haruki; Sato, Jun; Kojima, Masakazu; Ebiko, Hirotoshi; and Ito, Takeshi. 6,015,953, Cl. 174-79.000.

Echeverry, Jan M.; Fernandez, Luis M.; Jervis, James E.; Robinson, Janine C.; Tanaka, Shigeru; and Voss, Laveille K., to General Surgical Innovations, Inc. Apparatus and method for developing an anatomic space for laparoscopic procedures. 6,015,421, Cl. 606-190.000.

Echtle, Danny: *See*—
Sanchez, Ivan; Echtle, Danny; and Vines, Landon B., 6,016,001, Cl. 257-530.000.

Eckhardt, Claude: *See*—
Reinehr, Dieter; Eckhardt, Claude; Hochberg, Robert; Kaufmann, Werner; and Metzger, Georges. 6,015,504, Cl. 252-8.910.

Eclipse Surgical Technologies, Inc.: *See*—
Mueller, Richard L.; Daniel, Steve A.; and Harman, Stuart D., 6,015,427, Cl. 606-232.000.

Ecolab Inc.: *See*—
Lokkesmoe, Keith D.; Hei, Robert D.; and Schilling, Joel J., 6,015,536, Cl. 423-210.000.

Eden, J. Gary: *See*—
DeTemple, Thomas A.; Frame, James; Wheeler, David J.; and Eden, J. Gary, 6,016,027, Cl. 313-356.000.

Edgar, Bradley L.: *See*—
McAdams, Stephen R.; Edgar, Bradley L.; Martin, Richard J.; Kilgo, Marvin M.; Baer, Christopher B.; and Stilger, John D., 6,015,540, Cl. 423-659.000.

Edwards, David Scott: *See*—
Sworin, Michael; Rajopadhye, Milind; Harris, Thomas David; Edwards, David Scott; Cheesman, Edward Hollister; and Liu, Shuang, 6,015,904, Cl. 546-278.700.

Edwards, Jeffrey Charles; and Morgan, Michael Graham, to Expro North Sea Limited. Lightweight intervention system for use with horizontal tree with internal ball valve. 6,015,013, Cl. 166-360.000.

Edwards, Keith Russell: *See*—
Barton, Paul; Searle, Jeffrey Graham; Chrystie, Peter John; and Edwards, Keith Russell, 6,016,123, Cl. 342-373.000.

EG&G Pressure Science, Inc.: *See*—
Swensen, Jeffrey E.; Nolan, Terence J.; Spence, J. Loyd; and Rhyne, Edward P., 6,015,152, Cl. 277-321.000.

Egan, James E. Kit for mounting a pickup box on a truck frame. 6,015,176, Cl. 296-35.100.

Egging, Philip J.; Bartels, Brent A.; and Kappel, Gary W., to Vermeer Manufacturing Company. Control system for stump cutters. 6,014,996, Cl. 144-334.000.

Ehnebuske, David Lars; and McKee, Barbara Jane Alspach, to International Business Machines Corporation. Method and apparatus for identifying applicable business rules. 6,016,477, Cl. 705-7.000.

Ehrhart, Michael A.: *See*—
Parker, James A.; and Ehrhart, Michael A., 6,015,088, Cl. 235-462.010.

Eichenberg, Paul M.: *See*—
Ray, Gary L.; Butler, Raymond S.; Buening, Dennis J.; Kobrehel, Michael D.; Cripe, Todd E.; Eichenberg, Paul M.; Eloian, Yasmin W.; Deperro, Charles A.; Czopek, Brian J.; and Inman, Mary M., 6,014,840, Cl. 49-413.000.

Eisele, Raymund: *See*—
Barrett, Paul; and Eisele, Raymund, 6,015,093, Cl. 235-492.000.

Eisert, Wolfgang; and Gruber, Peter, to Thomae GmbH, Dr. Karl. Pharmaceutical compositions containing dipyridamole or mopidamol and acetylsalicylic acid or the physiologically acceptable salts thereof, processes for preparing them and their use in treating clot formation. 6,015,577, Cl. 424-451.000.

Ejiri, Kiyomi; Inaba, Hiroo; Saito, Shinji; and Hayakawa, Satoru, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 6,015,602, Cl. 428-141.000.

Ekwall, Christer; and Norén, Kjell, to Pacesetter AB. Implantable ischemia detector and implantable stimulator employing same. 6,016,443, Cl. 600-519.000.

Elcock, Robin William; Yamamoto, Albert K.; and Louw, John A., to Fairchild Holding Corp. Five spindle fluting machine. 6,015,351, Cl. 470-10.000.

Elder, Danny J. Process for treating green wood. 6,014,819, Cl. 34-396.000.

Electric Fuel Ltd.: *See*—
Goldstein, Jonathan; Givon, Menachem; and Zingerman, Yuli, 6,015,636, Cl. 429-229.000.

Electron R+D International, Inc.: *See*—
Goukassian, Samuel, 6,015,588, Cl. 427-77.000.

Electronic Retailing Systems: *See*—
Failing, Bruce F, Jr.; Fernandez, Anthony P; Briechle, George T; Fenwick, Edward J; and Venable, Robert J, 6,016,481, Cl. 705-28.000.

Electronics and Telecommunications Research Institute: *See*—
Seong, Myung Je; Lee, Eun Jeong; and Cho, Yeong Wook, 6,016,558, Cl. 714-45.000.

ElF Exploration Production: *See*—
Thore, Pierre, 6,016,461, Cl. 702-6.000.

Elfstrand, James K.: *See*—
Nepsund, Larry R.; Abrahamson, Kathleen A.; Boeckermann, Thomas A.; and Elfstrand, James K., 6,015,452, Cl. 95-287.000.

Eli Lilly and Company: *See*—
Engel, Gary Lowell; Farid, Nagy Alphonse; Faul, Margaret Mary; Jirousek, Michael Robert; Richardson, Lori Ann; and Winneroski, Leonard Larry, Jr., 6,015,807, Cl. 514-183.000.

Elia, Carlo: *See*—
Caire, Guiseppe; and Elia, Carlo, 6,016,328, Cl. 375-272.000.

Elion, Wiveka Jacoba; Klein Nagelvoort, Robert; and Vink, Jan Kornelis, to Shell Research Limited. Reducing the amount of components having low boiling points in liquefied natural gas. 6,014,869, Cl. 62-621.000.

Elisha Technologies Co LLC: *See*—
Dalton, William M., 6,015,855, Cl. 524-442.000.

Elliott, Terrence Charles; Nevill, Gary John; Byrne, Ian Kenneth; Adams, Anthony Mason; Courtney, M Lyle; and Spencer, David, to Commonwealth Scientific and Industrial Research Organisation. Wood corer device. 6,015,248, Cl. 408-204.000.

Ellis, David L.: *See*—
Guzik, Andrew T.; Ellis, David L.; Yorio, Rudy; Pratt, Steven D.; and Muthuswamy, Sivakumar, 6,015,970, Cl. 250-229.000.

Ellis, Michael D.: *See*—
Knudson, Edward B.; Ellis, Michael D.; Thomas, William L.; and Davis, Bruce L., 6,016,141, Cl. 345-327.000.

Eloian, Yasmin W.: *See*—
Ray, Gary L.; Butler, Raymond S.; Buening, Dennis J.; Kobrehel, Michael D.; Cripe, Todd E.; Eichenberg, Paul M.; Eloian, Yasmin W.; Deperro, Charles A.; Czopek, Brian J.; and Inman, Mary M., 6,014,840, Cl. 49-413.000.

Elson, Edward E.; and Koh, Lawrence R. Needle point guard safety cap assembly. 6,015,397, Cl. 604-192.000.

Eltexelektrostatik GmbH: *See*—
Hahne, Ernst August; and Kunzig, Hermann, 6,015,257, Cl. 414-788.000.

Emalfarb, Mark A.: *See*—
Emalfarb, Mark Aaron; Ben-Bassat, Arie; and Sinitsyn, Arkady Panteleimonovich, 6,015,707, Cl. 435-263.000.

Emalfarb, Mark Aaron; Ben-Bassat, Arie; and Sinitsyn, Arkady Panteleimonovich, to Emalfarb, Mark A. Treating cellulosic materials with cellulases from chrysosporium. 6,015,707, Cl. 435-263.000.

EMC Corporation: *See*—
Pignolet, Lawrence G.; and Teachout, Jeffrey, 6,016,252, Cl. 361-724.000.

EMC Technology LLC: *See*—
Mazzochette, Joseph B., 6,016,085, Cl. 333-22.00R.

Emhart Inc.: *See*—
Wiessler, Hans; and Liebich, Kurt, 6,015,962, Cl. 219-98.000.

Emma, Philip George: *See*—
Bozso, Ferenc Miklos; and Emma, Philip George, 6,016,267, Cl. 365-145.000.

Emonds, Mark V. M.: *See*—
Siddall, Thomas L.; Emonds, Mark V. M.; Krumel, Karl L.; Schomaker, Jennifer M.; and Zettler, Mark W., 6,015,911, Cl. 548-369.400.

Ems-Inventa AG: *See*—
Hochuli, Martin; and Dietrich, Robert, 6,015,954, Cl. 174-110.00R.

Endermann, Rainer: *See*—
Springer, Wolfgang; Bremm, Klaus-Dieter; and Endermann, Rainer, 6,015,666, Cl. 435-6.000.

Endo, Naruhiko: *See*—
Amano, Yasunobu; Ichida, Koji; Endo, Naruhiko; Ohshige, Yoichi; and Mizuki, Masahiko, 6,016,030, Cl. 313-414.000.

Endo, Yasuharu: *See*—
Yano, Toshiyuki; Kojima, Hitoshi; Hiraoka, Eisuke; Chujo, Akihiko; Watanabe, Kaoru; Nagai, Hiromi; Endo, Yasuharu; and Hashimoto, Ken, 6,015,455, Cl. 106-31.580.

Endo, Yukio; Nakamura, Nobuhiro; and Ogo, Ikuo, to Advanced Display Inc. Method for manufacturing electro-optic element. 6,016,174, Cl. 349-43.000.

Endoh, Kenjiro; and Todd, Craig Campbell, to Kabushiki Kaisha Toshiba. Audio system which not only enables the application of the surround sytem standard to special playback uses but also easily maintains compatibility with a surround system. 6,016,295, Cl. 369-49.000.

Endorecherche: *See*—
Labrie, Fernand; Merand, Yves; and Singh, Shankar M., 6,015,806, Cl. 514-178.000.

Energy & Environmental International, L.C.: *See*—
Eaton, Gerald B.; Monahan, Michael J.; and Tipton, Robert J., 6,015,779, Cl. 508-591.000.

Engel, Gary Lowell; Farid, Nagy Alphonse; Faul, Margaret Mary; Jirousek, Michael Robert; Richardson, Lori Ann; and Winneroski, Leonard Larry, Jr., to Eli Lilly and Company. Protein kinase C inhibitor. 6,015,807, Cl. 514-183.000.

Engel Maschinenbau Gesellschaft M.B.H.: *See*—
Eppich, Stefan; and Kappelmuller, Werner, 6,015,284, Cl. 425-587.000.

English, Susan I.: *See*—
DiGiacomo, Joseph; Lecinski, Daniel J.; Laughlin, Kenneth S.; and English, Susan I., 6,015,197, Cl. 312-223.600.

Enokihara, Akira: *See*—
Mizuno, Koichi; Enokihara, Akira; Higashino, Hidetaka; and Setsune, Kentaro, 6,016,434, Cl. 505-210.000.

Enomoto, Youichi: *See*—
Mizuno, Yuuji; Ishimaru, Yoshihiro; and Enomoto, Youichi, 6,016,433, Cl. 505-190.000.

Ensemble Communications, Inc.: *See*—
Gilbert, Sheldon L.; Hadar, Rami; and Klein, Israel J., 6,016,311, Cl. 370-280.000.

Enshu, Hisayuki: *See*—
Mizuno, Osamu; Enshu, Hisayuki; and Nakamura, Tohru, 6,016,239, Cl. 360-104.000.

Ensign, Lawrence Frank; and King, Wayde Barry, to ITT Manufacturing Enterprises, Inc. Impedance improved coax connector. 6,015,315, Cl. 439-578.000.

Enzacta R & D Limited: *See*—
Bagshawe, Kenneth Dawson, 6,015,556, Cl. 424-134.100.

Epiclone Inc.: *See*—
Lin, Shi-Lung; and Ying, Shao-Yao, 6,015,676, Cl. 435-6.000.

Eppich, Stefan; and Kappelmuller, Werner, to Engel Maschinenbau Gesellschaft M.B.H. Injection unit for injection molding machines. 6,015,284, Cl. 425-587.000.

ERC Industries: *See*—
Allen, Jack R., 6,015,009, Cl. 166-89.300.

Erdelen, Christoph: *See*—
Krämer, Wolfgang; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Turberg, Andreas; and Mencke, Norbert, 6,015,823, Cl. 514-374.000.

Ergotron, Inc.: *See*—
Sweere, Harry C.; Gonnerman, Michael D.; and Voeller, Donald M., 6,015,120, Cl. 248-123.110.

Erickson, Kevin Jack: *See*—
Blank, Timothy J.; Boutaghou, Zine-Eddine; Erickson, Kevin Jack; and Greenberg, Richard, 6,016,234, Cl. 360-75.000.

Ericsson Inc.: *See*—
Hicks, Scott Gordon; and Hoover, David James, 6,016,424, Cl. 455-414.000.
Holshouser, Howard E., 6,016,126, Cl. 343-702.000.
Holshouser, Howard Eugene, 6,016,431, Cl. 455-550.000.
Sadowski, Bogdan, 6,016,069, Cl. 327-156.000.

Eridania Beghin-Say: *See*—
Maitre, Jean-Paul; Mentech, Julio; Reynaud, Sylvie; and Wong, Emile, 6,015,466, Cl. 127-30.000.

Erofeev, Andrei V.: *See*—
Altshuler, Gregory; and Erofeev, Andrei V., 6,015,404, Cl. 606-9.000.

Esaki, Isamu: *See*—
Kimura, Atsunori; Ono, Yoichi; Minamishin, Hayato; Tanaka, Yuji; Ohno, Seiichi; Hata, Hidekazu; Ueda, Hiroyuki; Esaki, Isamu; and Uchida, Atsushi, 6,015,147, Cl. 271-163.000.

Escane, Richard, to A.C. Egerton Limited. Connector unit. 6,015,312, Cl. 439-417.000.

Esche, Carl Kurt, Jr.: *See*—
Mike, Carl Anthony; Anderson, Gregory Paul; and Esche, Carl Kurt, Jr., 6,015,863, Cl. 525-333.700.

Espino, Cynthia: *See*—
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Jamison, Keith D.; and Kempel, Mike L., 6,015,459, Cl. 117-2.000.

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Chang, David, 6,015,360, Cl. 474-80.000.

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Macleod, Allan; McCorry, Mark; and Falconer, Graeme, 6,015,014, Cl. 166-374.000.

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Henrickson, Kelly J.; and Fan, Jiang, 6,015,664, Cl. 435-5.000.

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Hilgarth, Kurt, 6,015,157, Cl. 280-11.270.

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Hill, Kenneth O.; and Farries, Mark, 6,016,375, Cl. 385-37.000.

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Chambliss, David Darden; Farrow, Robin Frederick Charles; Marks, Ronald Franklin; and Tober, Eric Dean, 6,015,632, Cl. 428-692.000.

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Bolan, Michael L.; and Fekete, Nicholas M. G., 6,016,255, Cl. 361-807.000.

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Bias, Larry S.; and Ferguson, Robert E., 6,015,274, Cl. 417-423.100.

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Failing, Bruce F, Jr.; Fernandez, Anthony P; Briechle, George T; Fenwick, Edward J; and Venable, Robert J, 6,016,481, Cl. 705-28.000.

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Echeverry, Jan M.; Fernandez, Luis M.; Jervis, James E.; Robinson, Janine C.; Tanaka, Shigeru; and Voss, Laveille K., 6,015,421, Cl. 606-190.000.

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Gonzalez, Frank J.; and Fernandez-Salguero, Pedro, 6,015,673, Cl. 435-6.000.

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Keller, Christopher G.; and Ferrari, Mauro, 6,015,599, Cl. 428-34.400.

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Schneider, Eric; Ferril, Chuck; Wheeler, Doug; Schwartz, Larry; and Bruggeman, Edward, 6,016,553, Cl. 714-21.000.

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Neff, Edward A.; Sheaffer, Michael S.; Ferris, Michael A.; Huang, David; Haidos, Steven; Boyle, Kieran; and Stom, Dennis, 6,016,039, Cl. 318-115.000.

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Corazza, Alessio; Boffito, Claudio; Gallitognotta, Alessandro; Kullberg, Richard C.; and Ferris, Michael L., 6,016,034, Cl. 313-553.000.

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Stoll, Kurt; Mödinger, Uwe; and Waldmann, Dieter, 6,014,924, Cl. 92-13.500.

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Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Martin, Varenka; Weigelt, Oliver; Winckel, Laurent; and Yoshida, Satoshi, 6,016,331, Cl. 375-371.000.

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Casciola, Dean; and Figoli, Michael J., 6,016,127, Cl. 343-731.000.

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Kidd, Robert Andrew; and Filbrun, Nova Kay, 6,015,223, Cl. 362-503.000.

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Debras, Guy; and Dath, Jean-Pierre, 6,015,866, Cl. 526-101.000.

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Seifert, Dean Alan; Stoutenburg, Earney; and Vogt, Paul J., 6,015,087, Cl. 235-379.000.

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Orima, Hajime, 6,015,618, Cl. 428-373.000.

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Fischell, Robert E.; Fischell, David R.; and Upton, Adrian R. M., 6,016,449, Cl. 607-45.000.

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Brown, Gerald Ivan; Morton, Kevin John; and Flannigan, Martin John, 6,015,441, Cl. 44-393.000.

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Fletcher, Richard Edmond: *See*—
Rimington, Richard Michael; and Fletcher, Richard Edmond, 6,015,471, Cl. 156-274.400.

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Ivri, Yehuda; De Young, Linda R.; Wu, Cheng H.; Cater, Miro S.; Kumar, Vijay; and Flierl, Markus, 6,014,970, Cl. 128-200.160.

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Maahs, Karl Andrew; and Floge, Dennis Perry, 6,015,347, Cl. 463-27.000.

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Anderson, Thomas B.; Drucker, Elliott; and Robinson, John Dennis, 6,015,451, Cl. 95-184.000.

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Hay, Lloyd F.; and Dambak, Thomas L., 6,015,232, Cl. 374-138.000.

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Khan, Ashraf R.; Ramanathan, Sasangan; and Foggiato, Giovanni Antonio, 6,015,759, Cl. 438-707.000.

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Lewis, Peter B.; and Fonteneau, Norman, 6,014,902, Cl. 73-861.120.

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Umphries, Donald V.; Owen, Harold D.; Ford, Bobby R.; and Wesson, David S., 6,014,933, Cl. 102-312.000.

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Gates, Freeman Carter, 6,014,961, Cl. 123-568.210.
Ma, Thomas Tsoi-Hei, 6,014,959, Cl. 123-568.190.
Taylor, Steven Michael, 6,014,876, Cl. 70-240.000.

Fordham, Andrew J.: *See—*
Coombs, Christopher E.; Richter, Robert J.; Peel, Richard M.; and Fordham, Andrew J., 6,016,160, Cl. 348-61.000.

Forray, Carlos C.: *See—*
Gluchowski, Charles; Forray, Carlos C.; Chiu, George; Branchek, Theresa A.; Wetzel, John M.; and Hartig, Paul R., 6,015,819, Cl. 514-318.000.

Forrester, Julie: *See—*
Ritchie, David John; Munns, Gordon Richard; Forrester, Julie; Standen, Michael Charles Henry; Worthington, Paul Anthony; and Jones, Raymond Vincent Heavon, 6,015,905, Cl. 546-288.000.

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Gerhold, Jürgen, 6,016,094, Cl. 335-216.000.

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Rieb, Dale; Fosse, Lorna; and Pomeranz, Mark L., 6,015,407, Cl. 606-41.000.

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Rieger, Harry; Shields, Henry; and Foster, Richard, 6,016,324, Cl. 372-25.000.

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Murti, Dasarao K.; and Foucher, Daniel A., 6,015,645, Cl. 430-59.000.

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Restive, Mario J., 6,015,100, Cl. 239-428.500.

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Lewis, Peter B.; and Fonteneau, Norman, 6,014,902, Cl. 73-861.120.

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Jamil, Said; Dufour, Jean-Pierre Ghislain; and Deffense, Etienne Marie Joseph, 6,015,915, Cl. 554-184.000.

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Fraivillig, James, 6,015,607, Cl. 428-214.000.

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DeTemple, Thomas A.; Frame, James; Wheeler, David J.; and Eden, J. Gary, 6,016,027, Cl. 313-356.000.

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Motzko, Andrew R.; Korbel, Garry E.; Baker, John M.; and Francis, Stuart K., 6,016,043, Cl. 318-606.000.

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Dangelmayer, George Theodore; DeChiaro, Louis F.; Franey, John Philip; and Jon, Min-Chung, 6,016,246, Cl. 361-220.000.

Frankewich, Walter J., Jr.: *See—*
Boyd, Randal D.; and Frankewich, Walter J., Jr., 6,016,100, Cl. 340-384.200.

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Harmon, Paul A.; Cabral-Lilly, Donna J.; Franklin, J. Craig; Reed, Robert A.; and Janoff, Andrew S., 6,015,716, Cl. 436-501.000.

Fraser, Stephen G.: *See—*
Bernier, Donald R.; Fraser, Stephen G.; and Juengel, Richard O., 6,015,037, Cl. 194-318.000.

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Pierce, James Michael; Shoreibah, Mohamed G.; Adler, Beverly; and Fregien, Nevis Lee, 6,015,701, Cl. 435-193.000.

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Hoffmann, Christian; Freudenberg, Hellmut; Gerken, Hartmut; Hecker, Martin; and Pirkl, Richard, 6,016,040, Cl. 318-116.000.

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Nickias, Peter N.; McAdon, Mark H.; Patton, Jasson T.; Friedrichsen, Bernard P.; Soto, Jorge; Stevens, James C.; and VanderLende, Daniel D., 6,015,868, Cl. 526-127.000.

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Ohya, Masakiyo, 6,014,806, Cl. 29-893.330.

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Ogawa, Nobuhiro; and Tsukuda, Masanori, 6,016,249, Cl. 361-685.000.
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Gardner, Mark I.; Fulford, H. Jim; and Kwong, Dim-Lee, 6,015,739, Cl. 438-287.000.

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Kurtz, Robert J.; and Fuller, William D., 6,015,792, Cl. 514-19.000.

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Anderson, J. Dale; and Fuqua, Don, 6,015,016, Cl. 172-677.000.

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Wada, Masashi; Okuba, Takao; and Furuno, Takeshi, 6,016,560, Cl. 714-718.000.

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Tsutsui, Toshikazu; and Furuta, Masaaki, 6,016,278, Cl. 365-200.000.

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Young, David, 6,015,072, Cl. 224-153.000.

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Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Martin, Varenka; Weigelt, Oliver; Winckel, Laurent; and Yoshida, Satoshi, 6,016,331, Cl. 375-371.000.

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Randazzo, Antonio; and Galassi, Rossano, 6,015,114, Cl. 242-559.200.

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Savino, John E.; Gallagher, Thomas P.; Macy, Barbara Reid; Scully, Michael John; Toney, Elizabeth D.; Harlow, Ernest R.; and Naglieri, James W., 6,015,167, Cl. 283-67.000.

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Baldeschwieler, John D.; Gamble, Ronald C.; and Theriault, Thomas P., 6,015,880, Cl. 530-333.000.

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Cramer, Rudolf; and Slavicek, Rudolf, 6,015,291, Cl. 433-57.000.

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Martinchek, Gregory A.; and Yaffe, Max R., 6,015,484, Cl. 205-775.500.

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Schmidt, Raymond J., Jr.; Ganmukhi, Mahesh N.; and DeAngelis, Patrick L., 6,015,300, Cl. 439-61.000.

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Brewer, John C., 6,015,105, Cl. 241-30.000.

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Sanger, Philip Albert; Lindberg, Frank A.; and Garcen, Walter, 6,016,007, Cl. 257-714.000.

Garcia, Alejandro: *See*—
Smith, Kenneth; Krick, Brent; and Garcia, Alejandro, 6,015,493, Cl. 210-252.000.

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Sharrer, Kenneth J., 6,015,153, Cl. 277-412.000.

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McCarty, Jon G.; Wong, Victor L.; and Wood, Bernard J., 6,015,285, Cl. 431-7.000.

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Bradshaw, Madeline Joan; Jones, John Clifford; Sage, Ian Charles; McDonnell, Damien Gerard; and Gass, Paul Anthony, 6,016,180, Cl. 349-156.000.

Gastaldi, Roberto: *See*—
Rolandi, Paolo; Gastaldi, Roberto; and Calligaro, Cristiano, 6,016,271, Cl. 365-185.180.

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Sullivan, Jeffrey M.; and Gately, Daniel Anthony, 6,015,916, Cl. 556-7.000.

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Eberspächer, Helmut; Gauch, Winfried Hardy; Haf, Helmut; and Robel, Wolfgang, 6,016,035, Cl. 315-82.000.

Gauss, Kreg T.: *See*—
Siverling, Todd D.; Chroninger, William Anthony; Chroninger, William Andrew; Gauss, Kreg T.; and Radzinski, William S., 6,015,494, Cl. 210-299.000.

Gauthier, Robert J., Jr.: *See*—
Voldman, Steven H.; Gauthier, Robert J., Jr.; and Brown, Jeffrey S., 6,015,993, Cl. 257-355.000.
Gavin, Norman W. Filter system for septic tank. 6,015,488, Cl. 210-123.000.
Gazewood, Michael J. Method and apparatus for moving a piston. 6,015,018, Cl. 175-57.000.
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Dams, Joachim; and Starck, Thierry, 6,016,247, Cl. 361-602.000.
Girodet, Alain; and Vittoz, Marc, 6,015,960, Cl. 218-43.000.
GEC Avionics Limited: *See*—
Henderson, David Sydney; McGinn, William Douglas; and Miles, Stewart David, 6,016,116, Cl. 342-64.000.
Gedye, David M.: *See*—
Lambright, Patrick B.; and Gedye, David M., 6,015,348, Cl. 463-42.000.
Gee, Albert: *See*—
Finger, David J.; Bernard, Jonathan; and Gee, Albert, 6,015,385, Cl. 600-443.000.
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Gell, Maurice: *See*—
Padture, Nitin P.; Gell, Maurice; and Klemens, Paul G., 6,015,630, Cl. 428-632.000.
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Hudziak, Robert Michael; Shepard, H. Michael; and Ullrich, Axel, 6,015,567, Cl. 424-277.100.
General Electric Company: *See*—
Ma, Jingfei, 6,016,057, Cl. 324-309.000.
McDermott, Philip J.; O'Brien, Michael J.; and Jeram, Edward M., 6,015,853, Cl. 524-303.000.
Papallo, Thomas F., Jr.; Seymour, Raymond K.; and Tiwari, Anupam, 6,015,957, Cl. 200-244.000.
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Haseloff, James; and Goodman, Howard M., 6,015,794, Cl. 514-44.000.
General Magic, Inc.: *See*—
White, James E.; Helgeson, Christopher S.; and Steedman, Douglas A., 6,016,393, Cl. 395-683.000.
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Kotkowicz, George A., 6,015,103, Cl. 239-585.400.
Olin, Peter M.; and Maloney, Peter James, 6,016,460, Cl. 701-102.000.
Scoccia, Ardeean, 6,015,340, Cl. 454-69.000.
Shaw, Schuyler Scott; and Schenk, Donald Edward, 6,014,862, Cl. 60-533.000.
General Science and Technology: *See*—
Avellanet, Francisco J., 6,015,415, Cl. 606-113.000.
General Surgical Innovations, Inc.: *See*—
Echeverry, Jan M.; Fernandez, Luis M.; Jervis, James E.; Robinson, Janine C.; Tanaka, Shigeru; and Voss, Laveille K., 6,015,421, Cl. 606-190.000.
Zwart, Hans J.; Tyler, Lawrence R.; Palermo, Thomas J.; Bladel, Kevin Van; Young, Roderick A.; and Jervis, James E., 6,015,382, Cl. 600-207.000.
Genise, Thomas A.: *See*—
Markyvech, Ronald K.; Genise, Thomas A.; and McReynolds, James R., 6,015,366, Cl. 477-109.000.
Genna, Sebastian, to Digital Scintigraphics, Inc. Scintillation camera with improved scintillation material segment interfaces. 6,015,974, Cl. 250-368.000.
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Byker, Harlan J., 6,016,215, Cl. 359-272.000.
Genus Medical Inc.: *See*—
Broadhead, Douglas; Eakins, Richard; Cimachowski, Czeslaw; Bentley, Brian; Krommenhoek, Joe; Ma, Son; Harding, David; and Pang, Nelson, 6,015,189, Cl. 297-353.000.
GeoQuest, a division of Schlumberger Technology Corporation: *See*—
Klebba, Eric F.; and Van Bemmel, Peter P., 6,016,287, Cl. 367-72.000.
George, Richard D.: *See*—
Ewing, Kip A.; and George, Richard D., 6,015,184, Cl. 296-219.000.
Geraedts, Johannes-Adolf-Jacobus: *See*—
Toussaint, Philippe Marie; Queval, Patrick Robert; Geraedts, Johannes-Adolf-Jacobus; and Caumont, Jacques Andre, 6,015,846, Cl. 523-142.000.
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Gerken, Hartmut: *See*—
Hoffmann, Christian; Freudenberg, Hellmut; Gerken, Hartmut; Hecker, Martin; and Pirkl, Richard, 6,016,040, Cl. 318-116.000.
Gerlach, Uwe: *See*—
Brendel, Joachim; Gerlach, Uwe; Lang, Hans Jochen; and Weidmann, Klaus, 6,015,822, Cl. 514-357.000.
German, Gene: *See*—
Rockstein, George B.; Wilz, David M.; Colavito, Stephen J.; German, Gene; and Knowles, Carl Harry, 6,015,091, Cl. 235-472.010.
Germida, James John; Heins, Sherry Darlene; Manker, Denise Carol; Jiménez, Desmond Rito; and Marrone, Pamela Gail, to AgraQuest, Inc. *Bacillus subtilis* strain for controlling insect and nematode pests. 6,015,553, Cl. 424-93.462.
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Gessner, Thomas: *See*—
Dötzel, Wolfram; Gessner, Thomas; Hahn, Ramon; Kaufmann, Christian; Löwe, Heinz-Ulrich; Markert, Joachim; Rauch, Manfred; and Wollmann, Udo, 6,016,217, Cl. 359-292.000.
Gevaud, Roland: *See*—
Baret, Gilles; Gevaud, Roland; and Devance, Alain, 6,014,892, Cl. 73-40.700.
Ghaemi, Hadi F.; Li, Yao; Thio, Tineke; and Wang, Ting, to NEC Research Institute, Inc. Tapered coherent fiber bundle imaging device for near-field optical microscopy. 6,016,376, Cl. 385-116.000.
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Ghosh, Sobhan: *See*—
Ray, Sabyasachi Sinha; Tuli, Deepak Kumar; Sharma, Meeta; Rai, Madan Mohan; Ghosh, Sobhan; Bhatnagar, Akhilesh Kumar; Saxena, Prabhat Kumar; and Sivaram, Swaminathan, 6,015,768, Cl. 502-300.000.
Giacomini, Davide, to STMicroelectronics S.r.l. Low offset output stage for precision comparators. 6,016,078, Cl. 330-253.000.
Gibbons, James F.: *See*—
Gronet, Christian M.; and Gibbons, James F., 6,016,383, Cl. 392-416.000.
Gibbs, Richard A. L.: *See*—
Caskey, Charles Thomas; and Gibbs, Richard A. L., 6,015,675, Cl. 435-6.000.
Gibson, Georgia Ann: *See*—
Beer, John Carl; Bowman, Mark Tweed; Gibson, Georgia Ann; Lovgren, John; Radding, Marianne Poythress; and Yamakawa, Julieta Kaoru, 6,016,146, Cl. 345-349.000.
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Giese, Rossman F.: *See*—
Kostyniak, Paul J.; Giese, Rossman F.; Costanzo, Patricia M.; and Syracuse, Joseph A., 6,015,816, Cl. 514-299.000.
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McNabb, Lea Ann; and Gildea, David R., 6,016,120, Cl. 342-357.060.
Gillespie, Donald: *See*—
Blonstein, Steve; Chaney, Jack; Gillespie, Donald; and Wood, Eric, 6,016,144, Cl. 345-342.000.
Gillis, Christopher S. Soap holding scrub puff. 6,015,242, Cl. 401-201.000.
Giorgio, Paul J.: *See*—
Amuro, Stephen J.; and Giorgio, Paul J., 6,016,506, Cl. 709-217.000.
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Hansen, John P.; Gittinger, Robert Paul; and Stence, Ronald W., 6,016,537, Cl. 711-211.000.
Givon, Menachem: *See*—
Goldstein, Jonathan; Givon, Menachem; and Zingerman, Yuli, 6,015,636, Cl. 429-229.000.
Glaser, Robert. Toothbrush toy having interchangeable bendable and posable character handles. 6,015,328, Cl. 446-72.000.
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Schnabel, James P., Jr.; Shetterly, Donivan M.; and Malby, Robert E., Jr., 6,015,619, Cl. 428-410.000.
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Glatz, Gustav Adolf, 6,014,980, Cl. 135-20.100.
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Kaminski, Mark S.; Butchko, Gregory M.; Glenn, Stephan D.; and Wahl, Richard L., 6,015,542, Cl. 424-1.490.
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Goldberg, Mark; and Block, Marc G., 6,015,052, Cl. 211-187.000.
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Goble, Nigel Mark; and Goble, Colin Charles Owen, 6,015,406, Cl. 606-41.000.

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Maly, Neil Arthur; Wideman, Lawson Gibson; and Lukich, Lewis Timothy, 6,015,851, Cl. 524-243.000.
Patitsas, George Philemon; and Sandstrom, Paul Harry, 6,015,525, Cl. 264-315.000.

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Fromson, Howard A.; Gracia, Robert F.; and Rubin, Steven A., 6,014,931, Cl. 101-465.000.

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Walsh, Martin; and Adkins, Brian, 6,015,250, Cl. 410-100.000.

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Lacy, Alex B.; and Green, Justin J., 6,016,335, Cl. 379-67.000.

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Brookes, Graham Robert; Clare, David Andrew; Green, Phillip James; Smith, Richard John; and Woodhouse, Richard Graham, 6,015,155, Cl. 280-5.505.

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Schulz, Gregory R.; and Greene, Michael J., 6,015,458, Cl. 106-498.000.

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Dzhragatspanvan, Misak; and Greene, William A., 6,015,502, Cl. 210-793.000.

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Parks, Gerald R., 6,015,058, Cl. 220-229.000.

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Simons, F. Holmes; and Griffith, Ron L., 6,015,616, Cl. 428-364.000.

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Grigorescu, Virgil; and Grigorescu, Anca, 6,016,014, Cl. 290-55.000.

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Lostritto, Richard T., Jr.; and Groeger, Joseph H., 6,015,777, Cl. 508-208.000.

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Antaki, James F.; Paden, Bradley; Burgreen, Gregory; and Groom, Nelson, 6,015,272, Cl. 417-356.000.

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Ogilvie, Gregory K.; Davenport, Deborah J.; Gross, Kathy L.; and Hand, Michael S., 6,015,798, Cl. 514-57.000.

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Treleaven, Carl W.; and Grosskopf, Glenn A., 6,015,470, Cl. 156-267.000.

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Eisert, Wolfgang; and Gruber, Peter, 6,015,577, Cl. 424-451.000.

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Streinz, Christopher C.; Neville, Matthew; Grumbine, Steven K.; and Mueller, Brian L., 6,015,506, Cl. 252-186.100.

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Borst, Cornelius; Mansvelt Beck, Hendricus J.; Grundeman, Paul F.; and Jansen, Erik W. L., 6,015,378, Cl. 600-37.000.

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Shu, Chang-Qing, 6,016,470, Cl. 704-244.000.

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Chuang, Cheng-Woei; and Guan, Kuen Lin, 6,015,967, Cl. 219-519.000.

Guardian Industries Corp.: *See*—
Hartig, Klaus W.; Lingle, Philip J.; and Larson, Steven L., 6,014,872, Cl. 65-58.000.

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Fado, Frank; Guasti, Peter; Nassiff, Amado; and VanBuskirk, Ronald, 6,016,136, Cl. 345-133.000.

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Benedetti, Pier Alberto; Evangelista, Valtere; Guidarini, Dante; and Vestri, Stefano, 6,016,367, Cl. 382-275.000.

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Kidd, Robert Andrew; and Filbrun, Nova Kay, 6,015,223, Cl. 362-503.000.

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Collier, David; Guillot, Clint; and Harris, Peter, 6,014,783, Cl. 5-618.000.

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Camborde, Francoise; Cloarec, Alix; Gungor, Timur; and Teulon, Jean-Marie, 6,015,797, Cl. 514-46.000.

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Lindahl, Gunnar; Stalhammar-Carlemalm, Margaretha; and Stenberg, Lars, 6,015,889, Cl. 536-23.500.

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Possati, Stefano; Ventura, Luciano; and Gurrieri, Giovanni, 6,014,905, Cl. 73-866.300.

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Limper, Andrew H.; Leof, Edward B.; Thomas, Charles F.; and Gustafson, Michael P., 6,015,700, Cl. 435-183.000.

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Theodore, Louis J.; Kasina, Sudhakar; Reno, John M.; and Gustavson, Linda M., 6,015,897, Cl. 540-474.000.

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Petersen, Carolyn; Leech, James; Nelson, Richard C.; and Gut, Jiri, 6,015,882, Cl. 530-350.000.

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Williamson, John M.; Guterman, Alexandre J.; Zani, Robert; Newell, Terry; and Brown, Anthony K. Dale, 6,016,086, Cl. 333-109.000.

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Angel, Clive Graham; Ayling, Clive Lawrence; and Gutsell, Graham Scott, 6,014,921, Cl. 83-862.000.

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Goble, Nigel Mark; and Goble, Colin Charles Owen, 6,015,406, Cl. 606-41.000.

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Görge, Astrid; Meese-Marktscheffel, Juliane; Naumann, Dirk; Olbrich, Armin; and Schrumpf, Frank, 6,015,447, Cl. 75-255.000.

Ha, Jong-ho, to Samsung Electronics Co., Ltd. Method for sensing carriage position separation and compensating carriage position of an inkjet printer. 6,015,204, Cl. 347-37.000.
Haack, Brian. Truck bed liner with hingedly affixed divider. 6,015,178, Cl. 296-39.200.
Haas-Smith, Sally: *See*—
Golub, Lorne M.; Ritchlin, Christopher T.; Greenwald, Robert A.; Haas-Smith, Sally; Moak, Susan A.; and Lee, Hsi-Ming, 6,015,804, Cl. 514-152.000.
Habib, David J.: *See*—
Bosworth, Adam; Hunter, Ross A.; and Habib, David J., 6,016,488, Cl. 707-4.000.
Hachiya, Norihisa: *See*—
Ohnishi, Noriyuki; Takeuchi, Hiroyuki; Miyazawa, Kazutoshi; Hachiya, Norihisa; and Nakagawa, Etsuo, 6,015,508, Cl. 252-299.630.
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Gilbert, Sheldon L.; Hadar, Rami; and Klein, Israel J., 6,016,311, Cl. 370-280.000.
Haf, Helmut: *See*—
Eberspächer, Helmut; Gauch, Winfried Hardy; Haf, Helmut; and Robel, Wolfgang, 6,016,035, Cl. 315-82.000.
Haffner, William B.: *See*—
McCormack, Ann L.; and Haffner, William B., 6,015,764, Cl. 442-370.000.
Hagemann, Jörg; and Dzwonnek, Siegfried, to AGFA-Gevaert NV. Color photographic recording material. 6,015,654, Cl. 430-504.000.
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Hagio, Takeshi: *See*—
Taira, Kazuhiko; Kikuchi, Shinichi; Kurano, Tomoaki; Mimura, Hideki; and Hagio, Takeshi, 6,016,381, Cl. 386-95.000.
Hahn, Ramon: *See*—
Dötzel, Wolfram; Gessner, Thomas; Hahn, Ramon; Kaufmann, Christian; Löwe, Heinz-Ulrich; Markert, Joachim; Rauch, Manfred; and Wollmann, Udo, 6,016,217, Cl. 359-292.000.
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Haidos, Steven: *See*—
Neff, Edward A.; Sheaffer, Michael S.; Ferris, Michael A.; Huang, David; Haidos, Steven; Boyle, Kieran; and Stom, Dennis, 6,016,039, Cl. 318-115.000.
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Gam, Erik Andreas, 6,015,537, Cl. 423-360.000.
Halldin, Christer: *See*—
Foged, Christian; Halldin, Christer; Hiltunen, Jukka; and Farde, Lars, 6,015,544, Cl. 424-1.850.
Halpin, Claire: *See*—
Boudet, Alain; Pettenati, Jacqueline; Goffner, Deborah; Halpin, Claire; O'Connell, Ann; Romestant, Michel; Boerjan, Wout; and Leple, Jean-Charles, 6,015,943, Cl. 800-298.000.
Hamamatsu Photonics K.K.: *See*—
Inazuru, Tsutomu; and Suzuki, Kenji, 6,015,325, Cl. 445-28.000.
Hamann, David L.: *See*—
Stefanchik, David; Hamann, David L.; Flege, John B., Jr.; Ladd, Douglas N.; Lupton, J. Renee; and Craft, James A., 6,015,416, Cl. 606-144.000.
Hamann, Philip R.: *See*—
Hinman, Lois M.; and Hamann, Philip R., 6,015,562, Cl. 424-181.100.
Hamano, Shigeyuki: *See*—
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Mueller, Richard L.; Daniel, Steve A.; and Harman, Stuart D., 6,015,427, Cl. 606-232.000.
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Burberry, Mitchell S.; DeBoer, Charles D.; and Harris, Mark A., 6,014,930, Cl. 101-456.000.
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Collier, David; Guillot, Clint; and Harris, Peter, 6,014,783, Cl. 5-618.000.
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Lau, Lilip; Maroney, Charles T.; Hartigan, William M.; and Lam, Sharon, 6,015,429, Cl. 623-1.000.

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Fenkanyn, John M.; and Hartley, Tom T., 6,015,296, Cl. 434-301.000.

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Simon, Arno; and Hartmann, Wilfried, 6,016,440, Cl. 600-473.000.

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Van Vlasselaer, Peter; and Hasan, Shirin W., 6,015,843, Cl. 522-84.000.

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Teoh, Siang Teik, 6,014,968, Cl. 126-639.000.

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Miller, Charles G.; Rolls, John A.; and Hastings, Otis H., 6,015,965, Cl. 219-213.000.

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Kobayashi, Nobuyuki; Hashimoto, Kiyofumi; and Hatano, Takuji, 6,015,507, Cl. 252-299.010.

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Hauser, Ray M.; and Johnson, Alan W., to Hydro-Gear Limited Partnership. Hydrostatic transmission. 6,014,861, Cl. 60-487.000.

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Camberlin, Yves; Gonzalez, Serge; and Hauviller, Frédérique, 6,015,859, Cl. 525-112.000.

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Roohparvar, Fariborz F.; Mowlavi, Allahyar Vahidi; Hawes, Mark A.; and Cowan, Gregory L., 6,016,561, Cl. 714-720.000.

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Roslund, Richard N., Jr.; Nelson, Patrick; Wilkerson, Larry Allen; Roark, Troy; Dral, Joel; Simpson, Steve; and Clark, John, 6,015,187, Cl. 297-300.400.

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Kim, Thomas Dongsuk; Hawthorne, Seth Gordon; and Kosinski, Joseph Stanley, 6,016,474, Cl. 705-1.000.

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Gourrier, Serge; and Hazan, Jean-Pierre, 6,015,234, Cl. 374-164.000.

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Stossel, Clifford Alain, 6,015,437, Cl. 623-19.000.

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Morgan, Carlton B., 6,016,059, Cl. 324-556.000.

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Sukharev, Valeriy Y.; and Heine, David J., 6,016,009, Cl. 257-763.000.

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Baumgarten, Gerd-Diethard, 6,014,986, Cl. 137-526.000.

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Schönhöffer, Helmut, 6,015,436, Cl. 623-17.000.

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Törmälä , Pertti; Tamminmäki, Markku; Helevirta, Pertti; and Nigro, Dennis M., 6,015,410, Cl. 606-73.000.

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White, James E.; Helgeson, Christopher S.; and Steedman, Douglas A., 6,016,393, Cl. 395-683.000.

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Magnasco, John Harry; and Maxon, Eric, 6,016,347, Cl. 379-430.000.

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Zuk, Peter, Jr., 6,015,500, Cl. 210-767.000.

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Akram, Salman; Farnworth, Warren M.; Wood, Alan G.; and Hembree, David R., 6,016,060, Cl. 324-757.000.

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Blank, Norman E.; and Schenkel, Hubert K., 6,015,865, Cl. 525-524.000.

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Henry, Raymond C.: *See—*
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Thomas, Trent M.; Hensley, John A.; and Davidson, Troy T., 6,016,402, Cl. 395-828.000.

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Merry, Walter Richardson; Brown, William; Herchen, Harald; and Welch, Michael D., 6,015,761, Cl. 438-727.000.

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Dobler, Klaus; Zabler, Erich; Dukart, Anton; and Herrmann, Thomas, 6,016,104, Cl. 340-646.000.

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Luther, Helmut; Hüglin, Dietmar; and Herzog, Bernd, 6,015,575, Cl. 424-450.000.

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Cao, Min; Theil, Jeremy A; Ray, Gary W; and Vook, Dietrich W, 6,016,011, Cl. 257-773.000.
Heinzman, William, 6,016,143, Cl. 345-339.000.
Jimenez, Juan M.; Worley, A. Justine; Dodge, Charles W.; and Tribolet, David C., 6,015,143, Cl. 271-4.100.
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Wield, Paul Jeffrey, 6,016,207, Cl. 358-406.000.
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Goodfellow, Peter N., 6,015,670, Cl. 435-6.000.

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Bonville, Leonard J., Jr.; and Yang, Deliang, 6,015,634, Cl. 429-17.000.
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Mizuno, Yuuji; Ishimaru, Yoshihiro; and Enomoto, Youichi, 6,016,433, Cl. 505-190.000.
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Valunin, Igor; and Rozakis, George W., 6,015,435, Cl. 623-6.000.
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Vulih, Salomon; Preslar, Donald R.; and Jochum, Thomas A., 6,016,067, Cl. 327-94.000.
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Takeda, Tadashi; Hayashi, Yoshio; Takezoe, Hideo; and Ishikawa, Ken, 6,016,300, Cl. 369-103.000.

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Schneck, Jonathan; and O'Herrin, Sean, 6,015,884, Cl. 530-387.300.

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Hauser, Ray M.; and Johnson, Alan W., 6,014,861, Cl. 60-487.000.

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Sutton, Andrew Derek; and Johnson, Richard Alan, 6,015,546, Cl. 424-9.520.

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Cowperthwaite, George F.; Johnston, Allen D.; and Sheariss, Susan C., 6,015,549, Cl. 424-61.000.

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Huang, Yan; and Jones, Raymond K., 6,016,166, Cl. 348-515.000.

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Boyer, LeMoyne; and Jones, Robert Miler, 6,015,271, Cl. 417-321.000.

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Netzer, Emanuel; and Öhy, Günter, 6,015,199, Cl. 312-334.800.

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Kuhn, Roland; Junqua, Jean-Claude; and Contolini, Matteo, 6,016,471, Cl. 704-266.000.

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Kuster, Stephan; and Kuster, Heinz, 6,014,797, Cl. 28-146.000.

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Koike, Haruo; Ueda, Yasufumi; Matsuda, Koji; and Kabaki, Mikio, 6,015,921, Cl. 560-36.000.

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Chikazawa, Motonori; Kakinaka, Kohichi; and Honda, Shozo, 6,015,281, Cl. 425-226.000.
Seki, Mitsunori, 6,016,056, Cl. 324-165.000.

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Ohtomo, Fumio; Kimura, Kazuaki; Brabec, Vernon J.; Hirano, Satoshi; and Omori, Makoto, 6,016,455, Cl. 701-50.000.

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Endoh, Kenjiro; and Todd, Craig Campbell, 6,016,295, Cl. 369-49.000.
Hieda, Katsuhiko; Arikado, Tsunetoshi; and Okumura, Katsuya, 6,015,990, Cl. 257-310.000.
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Takahashi, Nozomu, 6,016,132, Cl. 345-82.000.
Wakayama, Kento, 6,016,438, Cl. 600-410.000.
Yoshida, Munehiro; and Kotani, Ryouji, 6,016,265, Cl. 365-96.000.

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Kogure, Eiji; Fukushima, Tadashi; Tsukahara, Hiroaki; Imai, Toshihisa; Oshima, Takao; and Kaga, Kunihiko, 6,015,008, Cl. 165-185.000.

Kaganove, Steven N.: *See*—
Grate, Jay W.; and Kaganove, Steven N., 6,015,869, Cl. 528-15.000.

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Isaksson, Will; Toht, Donald Edward; and Katz, Jeffry Han, 6,015,329, Cl. 446-424.000.

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Jamison, Keith D.; and Kempel, Mike L., 6,015,459, Cl. 117-2.000.

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Henderson, Corbett D.; and Winiecki, Jerry R., 6,015,373, Cl. 493-196.000.

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Schmitz, Jean-Claude; and Kerger, Léon, 6,014,984, Cl. 137-315.000.

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Sanchez, Michael; Khatib, Khaled M.; and Rice, David K., II, 6,015,615, Cl. 428-352.000.

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Omori, Shigeru; and Kieffer, Jean Marie, 6,015,586, Cl. 427-11.000.

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Hosotani, Ichiro; Tanaka, Hiroshi; Fuwa, Naohide; Maeda, Iwao; Kikori, Shigeo; and Kuretake, Ken, 6,014,955, Cl. 123-399.000.

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McAdams, Stephen R.; Edgar, Bradley L.; Martin, Richard J.; Kilgo, Marvin M.; Baer, Christopher B.; and Stilger, John D., 6,015,540, Cl. 423-659.000.

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Shin, Tae Hwan; Kim, Jong Nam; Choi, Tae Sun; and Yoon, Il, 6,016,365, Cl. 382-233.000.

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An, Joong-il; Kim, Kyung-su; Lim, Jung-su; and Kim, Jung-ki, 6,015,758, Cl. 438-706.000.

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Malone, Hugh Robert; Dendy, Deborah Sue; Cook, Dean Lawrence; Phillips, James R.; and Kommrusch, Richard S., 6,016,122, Cl. 342-372.000.

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Moroo, Jun; Mikami, Tomohisa; Mori, Masahiro; Chiba, Hirotaka; Nagata, Shigemi; Nakamura, Shigeyoshi; Konaka, Toshio; and Sato, Kazuhiko, 6,016,154, Cl. 345-442.000.

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Kawaguchi, Kunio; and Kondo, Tetsujiro, 6,016,164, Cl. 348-424.000.

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Ota, Masaki; Hamasaki, Masaru; Hori, Masayoshi; Kobayashi, Hisakazu; Koumura, Satoshi; and Makino, Yasunori, 6,015,269, Cl. 417-222.200.

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Okusawa, Tsutomu; Koyama, Kazuhito; Yamagishi, Masahiko; Hatamiya, Shigeo; Ajiro, Taiko; Sunou, Megumi; and Ishigaki, Yukio, 6,014,863, Cl. 60-653.000.

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Nicollian, Paul; and Krishnan, Srikanth, 6,016,062, Cl. 324-769.000.

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Van Autryve, Luc; and Lang, Stefan Oswald, 6,014,979, Cl. 134-1.100.

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Ahn, Stephen C.; and Lee, Suh Yong, 6,015,354, Cl. 473-256.000.

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Kleeman, Robert; and Liegeois, David D., 6,014,954, Cl. 123-339.130.

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Crayford, Ian S.; and Lo, William, 6,016,308, Cl. 370-252.000.

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Kaniewski, Wojciech Kazimierz; Lodge, Jennifer Katherine; and Turner, Nilgun Ereken, 6,015,940, Cl. 800-279.000.

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Evans, Edward Kelley; Long, Andrew Anthony; and West, Roderick Michael Peters, 6,016,137, Cl. 345-145.000.

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Biss, Charles E.; Longacre, Andrew, Jr.; and Hone, L. Michael, 6,016,135, Cl. 345-126.000.

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Kelly, Fred E., 6,015,219, Cl. 362-267.000.
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Elcock, Robin William; Yamamoto, Albert K.; and Louw, John A., 6,015,351, Cl. 470-10.000.
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Bakke, Stephen Peter; Lovin, William R.; Dobyns, Patrick E.; and Martindale, John, 6,016,498, Cl. 707-103.000.
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Chung, Tze-Chiang; and Lu, Honglan, 6,015,862, Cl. 525-320.000.
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Rolfes, Allen J.; and Jaynes, Scot Eric, 6,015,778, Cl. 508-394.000.
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Goudie, Stephen John, 6,016,089, Cl. 333-181.000.
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Niegel, Fritz; Schöneich, Guido; Arnold, Gerhard; and Lucchetti, Werner, 6,015,236, Cl. 384-276.000.
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Bergmann, Ernest Eisenhardt; and Derkits, Gustav Edward, Jr., 6,015,998, Cl. 257-446.000.
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Sussman, Robert Bradley; Bilicska, Carl Joseph; and Kasprzyk, Randolph Leonard, 6,016,058, Cl. 324-543.000.
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Yonkoski, Roger K.; Strobush, Brian L.; Ludemann, Thomas J.; and Yapel, Robert A., 6,015,593, Cl. 427-379.000.
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Boyer, LeMoyne; and Jones, Robert Miler, 6,015,271, Cl. 417-321.000.
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Starke, Henry; and Muirhead, Andrew, 6,016,016, Cl. 307-9.100.
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Maly, Neil Arthur; Wideman, Lawson Gibson; and Lukich, Lewis Timothy, 6,015,851, Cl. 524-243.000.
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Krantz, Jeffrey Isaac; Bloomfield, Marc Alan; and Luu, Thanh, 6,016,535, Cl. 711-171.000.
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Schmitz, Jean-Claude; and Kerger, Léon, 6,014,984, Cl. 137-315.000.
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Kiefer, Michael C.; and Barr, Philip J., 6,015,687, Cl. 435-69.100.
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Mueller, George G.; and Lys, Ihor A., 6,016,038, Cl. 315-291.000.
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Davies, Donald Selwyn, 6,015,799, Cl. 514-58.000.
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Wold, Cyle E.; and Arneson, Barry A., 6,016,025, Cl. 310-369.000.
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Joshi, Girish Chimanlal; and Noe, Stephen Allen, 6,015,450, Cl. 95-139.000.
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Huang, Kuo-Feng; Wang, Kuo-Chen; Hsu, Hsien-Jung; and Ma, Hung-Lung, 6,015,096, Cl. 239-73.000.
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Broadhead, Douglas; Eakins, Richard; Cimachowski, Czeslaw; Bentley, Brian; Krommenhoek, Joe; Ma, Son; Harding, David; and Pang, Nelson, 6,015,189, Cl. 297-353.000.
Ma, Thomas Tsoi-Hei, to Ford Global Technologies, Inc. Engine with EGR management system. 6,014,959, Cl. 123-568.190.
Maahs, Karl Andrew; and Floge, Dennis Perry, to Explosive Gaming, Inc. Progressive jackpot meter and display. 6,015,347, Cl. 463-27.000.
MacDonald, Lorne; and Pockrandt, Don, to North American Machine Manufacturing Ltd. Steel siding machine. 6,014,880, Cl. 72-181.000.
Macfarlane Burnet Centre for Medical Research Limited, The: *See—*
Deacon, Nicholas John; McPhee, Dale Alan; and Crowe, Suzanne, 6,015,661, Cl. 435-5.000.
Machacek, Zdenek: *See—*
McMahon, Michael J.; Van Erden, Donald L.; Kobetsky, Robert G.; Malin, Art; and Machacek, Zdenek, 6,014,795, Cl. 24-400.000.
Mackinnon, Russell D. N., to Pelmorex Media Inc. Object oriented communication network. 6,016,158, Cl. 348-7.000.
Macleod, Allan; McCorry, Mark; and Falconer, Graeme, to Baker Hughes Incorporated. Downhole lubricator and method. 6,015,014, Cl. 166-374.000.
Macy, Barbara Reid: *See—*
Savino, John E.; Gallagher, Thomas P.; Macy, Barbara Reid; Scully, Michael John; Toney, Elizabeth D.; Harlow, Ernest R.; and Naglieri, James W., 6,015,167, Cl. 283-67.000.

190-254 OG D-00 -- 25 : QL 3

Mader, Catherine: *See*—
Kang, Myung-Chol; Bray, Brian; Lichty, Maynard; Mader, Catherine; and Merutka, Gene, 6,015,881, Cl. 530-339.000.

Madigan, Kevin Robert: *See*—
Daly, Thomas Patrick; Koskol, Joseph Edward; Madigan, Kevin Robert; Takagi, Jun; and Yamauchi, Naofumi, 6,015,113, Cl. 242-474.500.

Mady' s Time Properties LLC: *See*—
Howald, Michel, 6,014,793, Cl. 24-265.00B.

Maeda, Hirokazu: *See*—
Nakamura, Akihiro; Kato, Masayoshi; Takahashi, Taro; and Maeda, Hirokazu, 6,015,840, Cl. 516-270.000.

Maeda, Iwao: *See*—
Hosotani, Ichiro; Tanaka, Hiroshi; Fuwa, Naohide; Maeda, Iwao; Kikori, Shigeo; and Kuretake, Ken, 6,014,955, Cl. 123-399.000.

Maeda, Yoshihiko: *See*—
Tanaka, Tatsuaki; Suhara, Toshihiro; Matsumoto, Toshihiro; Sagara, Hiroaki; and Maeda, Yoshihiko, 6,015,021, Cl. 180-206.000.

Maes, Stephane Herman; and Sedivy, Jan, to International Business Machines Corporation. Portable information and transaction processing system and method utilizing biometric authorization and digital certificate security. 6,016,476, Cl. 705-1.000.

Maesako, Taketo; Yamamoto, Kouki; Matsui, Yoshinori; and Sakakibara, Kenichi, to NEC Corporation. Semiconductor integrated circuit device. 6,016,280, Cl. 365-226.000.

Magnasco, John Harry; and Maxon, Eric, to Hello Direct, Inc. Optical switch for headset. 6,016,347, Cl. 379-430.000.

Magne, Remy: *See*—
Boutillon, Christophe; Martinon, Frederic; Sergheraert, Christian; Magne, Remy; Gras-Masse, Helene; Gomard, Elisabeth; Tartar, Andre; and Levy, Jean-Paul, 6,015,564, Cl. 424-208.100.

Magneti Marelli France: *See*—
Le Van, Adriana, 6,015,364, Cl. 477-97.000.

Mahalingaiah, Rupaka; McBride, Andrew; and Tran, Thang M., to Advanced Micro Devices, Inc. Reduced size storage apparatus for storing cache-line-related data in a high frequency microprocessor. 6,016,545, Cl. 712-238.000.

Mahdi, Syed Z.: *See*—
Hsieh, Harry W.; and Mahdi, Syed Z., 6,015,475, Cl. 156-331.400.

Mahrouyan, Ali: *See*—
Harskamp, Lisa; Mahrouyan, Ali; and Jacobsen, Steve, 6,016,138, Cl. 345-163.000.

Main, Joan C.: *See*—
Ramamurthy, Bhaskar S.; and Main, Joan C., 6,015,384, Cl. 600-440.000.

Maitre, Jean-Paul; Mentech, Julio; Reynaud, Sylvie; and Wong, Emile, to Eridania Beghin-Say. Microcrystalline sugars or sugar-alcohols; method for preparing the same. 6,015,466, Cl. 127-30.000.

Majima, Toshiro: *See*—
Kawazu, Yukio; Suzuki, Toshimitsu; Yuasa, Masayuki; Yokomizo, Yuichi; Majima, Toshiro; Ito, Takao; Nakashima, Takuji; and Nozawa, Akira, 6,015,925, Cl. 564-316.000.

Makhijani, Sunil: *See*—
Molinari, Lou; Gooderum, Steve; Peckholdt, Keith; DiMarco, Frank; Jackson, Michael; DePoalo, Ron; Makhijani, Sunil; Chung, Jennifer; Chou, Winnie; and Gould, Mary Beth, 6,016,482, Cl. 705-35.000.

Makino, Tetsushi: *See*—
Mitate, Takehito; Torata, Naoto; Minato, Kazuaki; Iida, Toyoshi; Makino, Tetsushi; Hamano, Shigeyuki; and Kameda, Naoyoshi, 6,015,637, Cl. 429-231.100.

Makino, Yasunori: *See*—
Ota, Masaki; Hamasaki, Masaru; Hori, Masayoshi; Kobayashi, Hisakazu; Koumura, Satoshi; and Makino, Yasunori, 6,015,269, Cl. 417-222.200.

Makita, Tetsuro: *See*—
Horikawa, Tsuyosi; Makita, Tetsuro; Kuroiwa, Takeharu; Mikami, Noboru; and Shibano, Teruo, 6,015,989, Cl. 257-309.000.

Malby, Robert E., Jr.: *See*—
Schnabel, James P., Jr.; Shetterly, Donivan M.; and Malby, Robert E., Jr., 6,015,619, Cl. 428-410.000.

Mali, James C.; and Becker, Scott T., to Artisan Components, Inc. Method and apparatus for eliminating bitline voltage offsets in memory devices. 6,016,390, Cl. 395-500.180.

Malin, Art: *See*—
McMahon, Michael J.; Van Erden, Donald L.; Kobetsky, Robert G.; Malin, Art; and Machacek, Zdenek, 6,014,795, Cl. 24-400.000.

Mallory, Timothy P., Sr., to Merrick Environmental Technology Inc. Modular pulsing header for fabric filters. 6,015,443, Cl. 55-302.000.

Malone, Hugh Robert; Dendy, Deborah Sue; Cook, Dean Lawrence; Phillips, James R.; and Kommrusch, Richard S., to Motorola, Inc. Phased array antenna using piezoelectric actuators in variable capacitors to control phase shifters and method of manufacture thereof. 6,016,122, Cl. 342-372.000.

Maloney, Peter James: *See*—
Olin, Peter M.; and Maloney, Peter James, 6,016,460, Cl. 701-102.000.

Maly, Neil Arthur; Wideman, Lawson Gibson; and Lukich, Lewis Timothy, to Goodyear Tire & Rubber Company, The. Rubber compositions containing bis anil compounds. 6,015,851, Cl. 524-243.000.

Mandelman, Jack A.: *See*—
Wheeler, Donald C.; Gambino, Jeffrey P.; Hsu, Louis L.; Mandelman, Jack A.; and Mih, Rebecca D., 6,015,991, Cl. 257-336.000.

Manger International Limited: *See*—
Rimington, Richard Michael; and Fletcher, Richard Edmond, 6,015,471, Cl. 156-274.400.

Manghisi, Elso: *See*—
Perego, Bruno; and Manghisi, Elso, 6,015,906, Cl. 546-321.000.

Manker, Denise Carol: *See*—
Germida, James John; Heins, Sherry Darlene; Manker, Denise Carol; Jiménez, Desmond Rito; and Marrone, Pamela Gail, 6,015,553, Cl. 424-93.462.

Manku, Mehar: *See*—
Horrobin, David Frederick; Manku, Mehar; McMordie, Austin; Knowles, Philip; Redden, Peter; and Pitt, Andrea, 6,015,821, Cl. 514-355.000.

Mann, Richard: *See*—
Worley, Eugene Robert, 6,016,268, Cl. 365-149.000.

Mannesmann Aktiengesellschaft: *See*—
Kaiser, Heinz-Peter; Richter, Klaus-Jürgen; and Müller, Niclas, 6,015,448, Cl. 75-560.000.

Mannesmann Sachs AG: *See*—
Carlson, Cora, 6,014,912, Cl. 74-574.000.
Dorfschmid, Jens; John, Thomas; and Seufert, Robert, 6,015,031, Cl. 192-3.580.
Grundei, Manfred, 6,015,030, Cl. 188-266.200.

Mansvelt Beck, Hendricus J.: *See*—
Borst, Cornelius; Mansvelt Beck, Hendricus J.; Grundeman, Paul F.; and Jansen, Erik W. L., 6,015,378, Cl. 600-37.000.

Map Medical Technologies Oy: *See*—
Foged, Christian; Halldin, Christer; Hiltunen, Jukka; and Farde, Lars, 6,015,544, Cl. 424-1.850.

Maples, Kirk R.: *See*—
Kelleher, Judith A.; Maples, Kirk R.; and Zhang, Yong-Kang, 6,015,831, Cl. 514-445.000.

Marchington, Alan Patrick: *See*—
Bell, Andrew Simon; Fray, Michael Jonathan; Marchington, Alan Patrick; Richardson, Kenneth; Stephenson, Peter Thomas; and Whittle, Peter John, 6,015,825, Cl. 514-383.000.

Marcus, Brian Harry: *See*—
Ashley, Jonathan James; and Marcus, Brian Harry, 6,016,330, Cl. 375-341.000.

Mardirossian, Aris, to Technology Patents, LLC. Land mine arming/disarming system. 6,014,932, Cl. 102-200.000.

Marelin, Miklos; Mossbrucker, Mark; Hinnen, Hans R.; and Whalen, John E., Jr., to Band-It-Idex, Inc. Band clamp including band and separately attached buckle. 6,014,792, Cl. 24-20.00R.

Marichal, Marc Leopold Karel Maria, to Atlas Copco Airpower, naamloze vennootschap. Blow-off device of a compressor unit and moisture separator used thereby. 6,015,260, Cl. 415-169.002.

Markert, Joachim: *See*—
Dötzel, Wolfram; Gessner, Thomas; Hahn, Ramon; Kaufmann, Christian; Löwe, Heinz-Ulrich; Markert, Joachim; Rauch, Manfred; and Wollmann, Udo, 6,016,217, Cl. 359-292.000.

Markley, Michael E.: *See*—
Horvitz, Eric J.; Markley, Michael E.; and Sonntag, Martin L., 6,016,145, Cl. 345-342.000.

Markovich, Ronald P.: *See*—
Maugans, Rexford A.; Knickerbocker, Ed N.; Sawchuk, Rebecca J.; Whetten, Alan R.; Markovich, Ronald P.; and Chum, Pak-Wing S., 6,015,617, Cl. 428-364.000.

Markowitz, H. Toby: *See*—
Juran, Carleen J.; Yakimow, Kristin; Shelton, Michael B.; Stroebel, John C.; Markowitz, H. Toby; Vatterott, Pierce; and Strandquist, Harry A., 6,016,447, Cl. 607-27.000.

Marks, Ronald Franklin: *See*—
Chambliss, David Darden; Farrow, Robin Frederick Charles; Marks, Ronald Franklin; and Tober, Eric Dean, 6,015,632, Cl. 428-692.000.

Marks, Steve: *See*—
Schlueter, Ross D.; and Marks, Steve, 6,015,476, Cl. 156-345.000.

Markyvech, Ronald K.; Genise, Thomas A.; and McReynolds, James R., to Eaton Corporation. Vehicular semi-automatic shift implementation system for lever-shifted, splitter-type, compound transmission with an intent-to-shift switch operable to cause automatic control of engine fueling and initiation of a splitter shift. 6,015,366, Cl. 477-109.000.

Maroney, Charles T.: *See*—
Lau, Lilip; Maroney, Charles T.; Hartigan, William M.; and Lam, Sharon, 6,015,429, Cl. 623-1.000.

Marposs Societa' Per Azioni: *See*—
Possati, Stefano; Ventura, Luciano; and Gurrieri, Giovanni, 6,014,905, Cl. 73-866.300.

Marquardt GmbH: *See*—
Seitz, Georg; Lach, Joachim; Klein, Ernst-Ludwig; Wolfschläger, Roland; and Sachs, Ekkehard, 6,016,253, Cl. 361-735.000.

Marquis, Edward T., to Huntsman Petrochemical Corporation. Method for controlling odor using alkylene carbonates. 6,015,550, Cl. 424-76.100.

Marrone, Pamela Gail: *See*—
Germida, James John; Heins, Sherry Darlene; Manker, Denise Carol; Jiménez, Desmond Rito; and Marrone, Pamela Gail, 6,015,553, Cl. 424-93.462.

Mars, Incorporated: *See*—
Kealey, Kirk S.; Snyder, Rodney M.; Romanczyk, Leo J., Jr.; Hammerstone, John F., Jr.; Buck, Margaret M.; and Cipolla, Giovanni G., 6,015,913, Cl. 549-386.000.

Marshall, John L., to Polaroid Corporation. Trisubstituted pyridine dyes. 6,015,907, Cl. 546-329.000.

Marson, Richard H.: *See*—

Gagnon, Louis R.; Pope, William P., Jr.; and Marson, Richard H., 6,014,988, Cl. 138-168.000.
Martin, David D.: *See*—
Barnes, Gregory; Skekloff, Jon; Martin, David D.; and Ray, Douglas, 6,016,096, Cl. 337-123.000.
Martin, Hans Göran Evald. Gas sensor. 6,016,203, Cl. 356-432.000.
Martin, Howard. Chemical disinfectant employing dual chain quaternary ammonium compounds with iodine. 6,015,836, Cl. 514-642.000.
Martin, James L.; Sirjani, Abolfazl; Seppi, Kevin D.; and Keeler, Lisa S., to BMC Software. Enterprise data movement system and method which performs data load and changed data propagation operations. 6,016,501, Cl. 707-203.000.
Martin, Paul C.: *See*—
Buzak, Thomas S.; Ilcisin, Kevin J.; Martin, Paul C.; Den Biggelaar, Hans J. G. A.; Bruinink, Jacob; Bongaerts, Petrus Franciscus Gerardus; Burgmans, Adrianus Leonardus Josephus; Khan, Babar Ali; and Van Helleputte, Henri Roger Jules Richard, 6,016,032, Cl. 313-493.000.
Martin, Richard J.: *See*—
McAdams, Stephen R.; Edgar, Bradley L.; Martin, Richard J.; Kilgo, Marvin M.; Baer, Christopher B.; and Stilger, John D., 6,015,540, Cl. 423-659.000.
Martin, Roger: *See*—
Dubs, Paul; Martin, Roger; and Evans, Samuel, 6,015,899, Cl. 544-171.000.
Martin, Varenka: *See*—
Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Martin, Varenka; Weigelt, Oliver; Winckel, Laurent; and Yoshida, Satoshi, 6,016,331, Cl. 375-371.000.
Martinchek, Gregory A.; and Yaffe, Max R., to Gamry Instruments, Inc. Detection of pitting corrosion. 6,015,484, Cl. 205-775.500.
Martindale, John: *See*—
Bakke, Stephen Peter; Lovin, William R.; Dobyns, Patrick E.; and Martindale, John, 6,016,498, Cl. 707-103.000.
Martinon, Frederic: *See*—
Boutillon, Christophe; Martinon, Frederic; Sergheraert, Christian; Magne, Remy; Gras-Masse, Helene; Gomard, Elisabeth; Tartar, Andre; and Levy, Jean-Paul, 6,015,564, Cl. 424-208.100.
Maruo, Katsuhiko; Shimizu, Keisuke; and Oka, Masami, to Matsushita Electric Works Ltd. Device for non-invasive determination of a glucose concentration in the blood of a subject. 6,016,435, Cl. 600-316.000.
Maruyama, Akio: *See*—
Anayama, Hideki; Maruyama, Akio; and Nakamura, Kazushige, 6,016,414, Cl. 399-159.000.
Maruyama, Susumu, to Windmill Kabushiki Kaisha. Internal-combustion type of gas lighter. 6,015,286, Cl. 431-130.000.
Marx, Jörg: *See*—
Lischewski, Regina; Sell, Ursula; Marx, Jörg; and Gohs, Uwe, 6,015,621, Cl. 428-411.100.
Masahiro, Yamanaka, to Shimano, Inc. Hollow crank spindle unit for bicycles. 6,014,913, Cl. 74-594.100.
Mascarenhas, Desmond; and Sanders, Martin, to Celtrix Pharmaceuticals, Inc. Method for increasing sex steroid levels using IGF or IGF/IGFBP-3. 6,015,786, Cl. 514-12.000.
Maschinenfabrik Polytype S..A.: *See*—
Goeb, Claude; and Süss, Karl-Heinz, 6,015,040, Cl. 198-438.000.
Mase, Hiroyuki: *See*—
Mizoshita, Yoshifumi; Yamada, Tomoyoshi; Kuroba, Yasumasa; Kouhei, Toru; Sugawara, Takao; Matsumoto, Masaru; Mase, Hiroyuki; Tsunekewa, Masao; Koganezawa, Shinji; and Aruga, Keiji, 6,016,237, Cl. 360-97.010.
Mase, Yasukazu; Matsui, Yoshitaka; Kubota, Takeshi; and Kitamura, Toshihiko, to Kabushiki Kaisha Toshiba. Chemical mechanical polishing apparatus and method. 6,015,754, Cl. 438-692.000.
Maslak, Samuel H.: *See*—
Wright, J. Nelson; Maslak, Samuel H.; Finger, David J.; and Gee, Albert, 6,016,285, Cl. 367-11.000.
Mason, Stuart: *See*—
Hoy, Michael D.; Arya, Deepak; Mason, Stuart; and Saunders, Martyn, 6,016,339, Cl. 379-106.070.
Massachusetts Institute of Technology: *See*—
Mermelstein, Michael S., 6,016,196, Cl. 356-345.000.
Massague, Joan: *See*—
Letarte, Michelle; Massague, Joan; Bernabeu, Carmelo; and Cheifetz, Sela, 6,015,693, Cl. 435-69.100.
Mastain, Steven A.; Peck, Wallace A.; Simplair, Diana M.; and Rothstein, Kurt A., to Seagate Technology, Inc. Narrow top poles for inductive magnetic heads, masks and processes for making the same. 6,016,242, Cl. 360-119.000.
Masuda, Fumitoshi: *See*—
Onishi, Katsuhiro; Yamauchi, Kiminori; Tsukada, Hideaki; Ueda, Yukinori; and Masuda, Fumitoshi, 6,016,098, Cl. 338-160.000.
Masuda, Kazuya: *See*—
Wakahara, Shirou; and Masuda, Kazuya, 6,015,208, Cl. 347-55.000.
Masuda, Tadaaki: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 6,016,162, Cl. 348-405.000.
Masuhara, Shin: *See*—
Yamatsu, Hisayuki; Kashiwagi, Toshiyuki; Imanishi, Shingo; and Masuhara, Shin, 6,016,302, Cl. 369-275.400.
Masure. H. Robert: *See*—
Tuomanen, Elaine; and Masure, H. Robert, 6,015,560, Cl. 424-150.100.
Mathieu, Gérard; and Desertot, Didier, to OTOR. Set of blanks, box, method and machine for making a box from said set of blanks. 6,015,084, Cl. 229-122.320.
Mathis, Roland, to Delphi France Automotive Systems. Automatic transmission requiring operation of single friction device for gear shift. 6,015,363, Cl. 475-281.000.
Mathur, Hitren: *See*—
Cannell, David W.; Mathur, Hitren; Nguyen, Nghi; and Espino, Cynthia, 6,015,574, Cl. 424-450.000.
Matrix Master Inc.: *See*—
Williams, Richard A., 6,015,225, Cl. 366-6.000.
Matsubara, Hideo. Modular units, modular structures having modular units, and method for constructing modular structures. 6,014,842, Cl. 52-79.120.
Matsubara, Kimikatsu, to Mitsubishi Electric Semiconductor Systems Corporation; and Mitsubishi Denki Kabushiki Kaisha. Communication control device. 6,016,521, Cl. 710-34.000.
Matsubara, Norihiro, to Whitaker Corporation, The. Circuit board mounted connector and contact used in the same. 6,015,316, Cl. 439-736.000.
Matsuda, Akihiro: *See*—
Arita, Koji; Fujii, Eiji; Shimada, Yasuhiro; Uemoto, Yasuhiro; Nasu, Toru; Matsuda, Akihiro; Nagano, Yoshihisa; Inoue, Atsuo; Matsuura, Taketoshi; and Otsuki, Tatsuo, 6,015,987, Cl. 257-303.000.
Matsuda, Kazuhiko; Toyoda, Hideyoshi; and Harada, Satoshi, to Kagome Kabushiki Kaisha. Antibacterial compounds for *Ralstonia solanacearum*. 6,015,830, Cl. 514-419.000.
Matsuda, Kenji: *See*—
Hashimoto, Kouji; Tsuchiya, Yoshiro; and Matsuda, Kenji, 6,016,408, Cl. 399-27.000.
Matsuda, Koji: *See*—
Koike, Haruo; Ueda, Yasufumi; Matsuda, Koji; and Kabaki, Mikio, 6,015,921, Cl. 560-36.000.
Matsuda, Minoru: *See*—
Miwa, Takao; Watanabe, Akira; Ito, Osamu; and Matsuda, Minoru, 6,015,596, Cl. 427-489.000.
Matsuda, Takeshi: *See*—
Miwa, Makoto; Isomura, Shigenori; Muramatsu, Toshihiko; Minagawa, Kazuji; Matsuda, Takeshi; and Kato, Takahiko, 6,014,958, Cl. 123-520.000.
Matsui, Norifumi: *See*—
Hidaka, Seiji; Matsui, Norifumi; Kubota, Kazuhiko; and Ise, Tomoyuki, 6,016,091, Cl. 333-202.000.
Matsui, Yoshinori: *See*—
Maesako, Taketo; Yamamoto, Kouki; Matsui, Yoshinori; and Sakakibara, Kenichi, 6,016,280, Cl. 365-226.000.
Matsui, Yoshitaka: *See*—
Mase, Yasukazu; Matsui, Yoshitaka; Kubota, Takeshi; and Kitamura, Toshihiko, 6,015,754, Cl. 438-692.000.
Matsumiya, Sadayuki; and Miyamoto, Shigeo, to Mitutoyo Corporation. Coordinate measuring apparatus with a ball probe. 6,014,816, Cl. 33-503.000.
Matsumoto, Masaru: *See*—
Mizoshita, Yoshifumi; Yamada, Tomoyoshi; Kuroba, Yasumasa; Kouhei, Toru; Sugawara, Takao; Matsumoto, Masaru; Mase, Hiroyuki; Tsunekewa, Masao; Koganezawa, Shinji; and Aruga, Keiji, 6,016,237, Cl. 360-97.010.
Matsumoto, Shyunichi: *See*—
Iwasaki, Hiroaki; Watanabe, Yukimasa; Saitoh, Sakae; Matsumoto, Shyunichi; and Uchida, Maki, 6,015,646, Cl. 430-83.000.
Matsumoto, Toshihiro: *See*—
Tanaka, Tatsuaki; Suhara, Toshihiro; Matsumoto, Toshihiro; Sagara, Hiroaki; and Maeda, Yoshihiko, 6,015,021, Cl. 180-206.000.
Matsumura, Takuo: *See*—
Yoshii, Hajime; and Matsumura, Takuo, 6,015,144, Cl. 271-97.000.
Matsunaga, Toru: *See*—
Nihei, Yukari; Matsunaga, Toru; and Tamura, Takashi, 6,016,243, Cl. 360-127.000.
Matsuno, Mitsuo: *See*—
Ikai, Keizo; and Matsuno, Mitsuo, 6,015,951, Cl. 136-257.000.
Matsuo, Kazuhiro: *See*—
Yamada, Takeshi; Matsuo, Kazuhiro; Yamaguchi, Ryuji; and Yamazaki, Akihiro, 6,015,696, Cl. 435-69.800.
Matsuo, Nobuyuki, to Shimano, Inc. Method and apparatus for shifting a bicycle transmission. 6,015,159, Cl. 280-238.000.
Matsushiba, Takuji; and Karube, Satoshi, to International Business Machines Corporation. Peripheral unit having at least two sequencer circuits configured to control data transfers for power saving. 6,016,549, Cl. 713-324.000.
Matsushima, Shinji; and Yamazaki, Mitsuhiro, to International Business Machines Corporation. Automatic master/slave designation for computer peripherals. 6,016,518, Cl. 710-8.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Arita, Koji; Fujii, Eiji; Shimada, Yasuhiro; Uemoto, Yasuhiro; Nasu, Toru; Matsuda, Akihiro; Nagano, Yoshihisa; Inoue, Atsuo; Matsuura, Taketoshi; and Otsuki, Tatsuo, 6,015,987, Cl. 257-303.000.
Hosokawa, Toshinori, 6,016,564, Cl. 714-726.000.
Kawakita, Yoshihiro; Hasegawa, Masanaru; Sakamoto, Kazunori; and Hatanaka, Hideo, 6,015,872, Cl. 528-102.000.
Kuhn, Roland; Junqua, Jean-Claude; and Contolini, Matteo, 6,016,471, Cl. 704-266.000.
Mifune, Tatsuo; Sakamoto, Kazunori; Ohata, Tsumoru; and Watanabe, Masaru, 6,015,592, Cl. 427-376.200.

Mizuno, Koichi; Enokihara, Akira; Higashino, Hidetaka; and Setsune, Kentaro, 6,016,434, Cl. 505-210.000.
Mizuno, Osamu; Enshu, Hisayuki; and Nakamura, Tohru, 6,016,239, Cl. 360-104.000.
Yoshikawa, Shouichi; Yukino, Shinya; and Naba, Masahiro, 6,016,238, Cl. 360-99.080.
Yosida, Takasi; Kane, Joji; and Nomura, Noboru, 6,016,109, Cl. 340-941.000.
Yuki, Koichiro; Morita, Kiyoyuki; Morimoto, Kiyoshi; and Hirai, Yoshihiko, 6,015,978, Cl. 257-25.000.

Matsushita Electric Works Ltd.: *See*—
Maruo, Katsuhiko; Shimizu, Keisuke; and Oka, Masami, 6,016,435, Cl. 600-316.000.
Tamura, Hideki; and Abe, Hideaki, 6,016,259, Cl. 363-20.000.

Matsushita, Mitsumasa; Taniguchi, Takumi; Ohta, Takashi; Sato, Norio; Hoshino, Yuji; Kondo, Kanemitsu; Abe, Naruaki; and Suzuki, Toshiyuki, to Toyota Jidosha Kabushiki Kaisha. Composite resin material and method of forming the same. 6,015,856, Cl. 524-451.000.

Matsuura, Taketoshi: *See*—
Arita, Koji; Fujii, Eiji; Shimada, Yasuhiro; Uemoto, Yasuhiro; Nasu, Toru; Matsuda, Akihiro; Nagano, Yoshihisa; Inoue, Atsuo; Matsuura, Taketoshi; and Otsuki, Tatsuo, 6,015,987, Cl. 257-303.000.

Matsuyama, Yuji: *See*—
Kimura, Yoshio; Morita, Satoshi; Matsuyama, Yuji; and Semba, Norio, 6,015,066, Cl. 222-64.000.

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Schaeffer, James Robert; Mauck, John Charles; Winterkorn, Robert Francis; and Arter, Thomas Charles, 6,015,683, Cl. 435-24.000.

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Freeman, Gary; and Mauer, Christopher, 6,016,193, Cl. 356-244.000.

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Ranmuthu, Indumini W.; and Mayfield, Glenn C., 6,016,077, Cl. 330-252.000.

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Buttgen, Heinz; Burger, Konrad; Callenbach, Tilo; Mazenauer, Karl; Riesen, Daniel; and Vuille, Daniel, 6,015,396, Cl. 604-192.000.

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Kaplan, Allen D.; and McCarthy, William F., 6,016,307, Cl. 370-238.000.

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Hopkins, John A.; Schwartz, Frederick A.; McCay, Mary Helen; McCay, Thurman Dwayne; Dahotre, Narendra B.; and Bible, John Brice, 6,016,227, Cl. 359-668.000.

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Flannery, Philip A.; McClafferty, Jason; and Orne, Donald A., 6,015,963, Cl. 219-121.520.

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Macleod, Allan; McCorry, Mark; and Falconer, Graeme, 6,015,014, Cl. 166-374.000.

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Bradshaw, Madeline Joan; Jones, John Clifford; Sage, Ian Charles; McDonnell, Damien Gerard; and Gass, Paul Anthony, 6,016,180, Cl. 349-156.000.

McGee, Brian G.: *See*—
Cowden, Gary L.; McGee, Brian G.; Puckett, Daniel R.; and Timmons, John P., 6,014,956, Cl. 123-446.000.

McGill, Thomas C.: *See*—
Levy, Harold J.; and McGill, Thomas C., 6,015,738, Cl. 438-275.000.

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Henderson, David Sydney; McGinn, William Douglas; and Miles, Stewart David, 6,016,116, Cl. 342-64.000.

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McGourthy, John D., Jr.; and DeBoer, Jon A., Jr., 6,015,032, Cl. 192-14.000.

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Hannagan, Angus Patrick Douglas; and McGrath, Michael Alan, 6,015,273, Cl. 417-417.000.

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Minor, Raymond B.; McGregor, Gordon L.; Wu, Huey Shen; and Lash, Daniel J., 6,015,610, Cl. 428-315.700.

McGuire, Donald G.: *See*—
Arnold, John K.; Bennett, John R.; Claar, Peter O.; Dahl, Kurt D.; Dobson, Jennifer L.; Fontaine, Charles A.; Johanson, Philip H.; McGuire, Donald G.; Swanson, Mary; Wagner, David G.; and Wainright, Steve, 6,016,504, Cl. 709-200.000.

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Ehnebuske, David Lars; and McKee, Barbara Jane Alspach, 6,016,477, Cl. 705-7.000.

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Horrobin, David Frederick; Manku, Mehar; McMordie, Austin; Knowles, Philip; Redden, Peter; and Pitt, Andrea, 6,015,821, Cl. 514-355.000.

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Goins, Fred A., III, 6,014,993, Cl. 140-105.000.

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Deacon, Nicholas John; McPhee, Dale Alan; and Crowe, Suzanne, 6,015,661, Cl. 435-5.000.

McPherson, Ross: *See*—
Dickinson, Alexander George; McPherson, Ross; Mendis, Sunetra; Ross, Paul C.; and Tyson, John A., 6,016,355, Cl. 382-124.000.

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Markyvech, Ronald K.; Genise, Thomas A.; and McReynolds, James R., 6,015,366, Cl. 477-109.000.

McTeer, Allen, to Micron Technology, Inc. Voidless metallization on titanium aluminide in an interconnect. 6,016,010, Cl. 257-764.000.

MCW Research Foundation: *See*—
Henrickson, Kelly J.; and Fan, Jiang, 6,015,664, Cl. 435-5.000.

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Hager, James W., 6,015,972, Cl. 250-282.000.

Meco Corporation: *See*—
Buono, Steven A., 6,015,185, Cl. 297-59.000.

Medar, Inc.: *See*—
Robinson, David A., 6,016,161, Cl. 348-187.000.

Meddiss, Incorporated: *See*—

Miyamoto, Tadaomi; and Miyamoto, Koho, 6,015,835, Cl. 514-562.000.
Medevelop AB: *See—*
Brånemark, Per-Ingvar, 6,015,937, Cl. 623-16.000.
MediVas, LLC: *See—*
Schwartz, Robert S.; VanTassel, Robert A.; and Holmes, David R., 6,015,387, Cl. 600-504.000.
Medsol, Corp.: *See—*
Rishton, Michael Lyne; Newman, Harold Leonard; and Goldenberg, Alec, 6,015,391, Cl. 600-567.000.
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Bischoff, Thomas C.; Dollimer, Michael R.; and Eastman, William J., 6,016,436, Cl. 600-374.000.
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Busacker, James W.; and Cinbis, Can, 6,016,448, Cl. 607-29.000.
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MedX 96, Inc.: *See—*
Steffee, Clay J; Berry, Larry D; and Kershaw, Russell W, 6,015,372, Cl. 482-137.000.
Meese-Marktscheffel, Juliane: *See—*
Görge, Astrid; Meese-Marktscheffel, Juliane; Naumann, Dirk; Olbrich, Armin; and Schrumpf, Frank, 6,015,447, Cl. 75-255.000.
Mehlert, Martin: *See—*
Stöxen, Oliver; and Mehlert, Martin, 6,015,038, Cl. 198-322.000.
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Chaouk, Hassan; Meijs, Gordon Francis; and Laycock, Bronwyn Glenice, 6,015,609, Cl. 428-308.400.
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Titterington, Donald R.; Meinhardt, Michael B.; Banning, Jeffery H.; and King, Clifford R., 6,015,847, Cl. 523-160.000.
Meinke, Charles W.: *See—*
Key, Al; Lemke, Gregory; Meinke, Charles W.; and Schilling, Ronald J., 6,015,278, Cl. 418-82.000.
Meir, Michaela: *See—*
Rekstad, John; Bjerke, Bard; and Meir, Michaela, 6,014,967, Cl. 126-592.000.
MEMC Electronic Materials, Inc.: *See—*
Roberts, Russell Bradley, 6,015,335, Cl. 451-72.000.
Memminger-IRO GmbH: *See—*
Ohlson, Per; and Jacobsson, Kurt Arne Gunnar, 6,015,109, Cl. 242-364.700.
Mencke, Norbert: *See—*
Krämer, Wolfgang; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Turberg, Andreas; and Mencke, Norbert, 6,015,823, Cl. 514-374.000.
Mendez, Alexis: *See—*
Yakymyshyn, Christopher; Brubaker, Michael; Schwarz, Michael; Mendez, Alexis; and Ebbinghaus, Dirk, 6,016,053, Cl. 324-96.000.
Mendis, Sunetra: *See—*
Dickinson, Alexander George; McPherson, Ross; Mendis, Sunetra; Ross, Paul C.; and Tyson, John A., 6,016,355, Cl. 382-124.000.
Mengeling, William L.: *See—*
Wesley, Ronald D.; Clouser, Deborah F.; Mengeling, William L.; Andreyev, Vladimir G.; Vorwald, Ann C.; and Lager, Kelly M., 6,015,663, Cl. 435-5.000.
Menicon Co., Ltd.: *See—*
Hiratani, Haruyuki, 6,015,874, Cl. 528-391.000.
Nakada, Kazuhiko; and Sugiyama, Akihisa, 6,015,213, Cl. 351-172.000.
Yasuda, Akihiro; and Niwa, Kazuharu, 6,015,511, Cl. 264-1.700.
Mensing, Joseph: *See—*
Reimers, Bruno; Mensing, Joseph; and Holtkamp, Wilhelm, 6,015,581, Cl. 426-282.000.
Mentech, Julio: *See—*
Maitre, Jean-Paul; Mentech, Julio; Reynaud, Sylvie; and Wong, Emile, 6,015,466, Cl. 127-30.000.
Mentgen, William P.: *See—*
Artemis, Chris A.; Mentgen, William P.; and Joseph, Daniel A., 6,015,165, Cl. 280-824.000.
Merand, Yves: *See—*
Labrie, Fernand; Merand, Yves; and Singh, Shankar M., 6,015,806, Cl. 514-178.000.
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Chen, Cheng Yi; Tan, Lushi; and Tillyer, Richard D., 6,015,926, Cl. 564-442.000.
Daifotis, Anastasia G.; Yates, A. John; and Santora, Arthur C., II, 6,015,801, Cl. 514-108.000.
Halczenko, Wasyl; and Stump, Craig A., 6,015,817, Cl. 514-301.000.
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Douglas, Joel S.; Roe, Jeffrey N.; Radwanski, Ryszard; and Duchon, Brent G., 6,015,392, Cl. 600-583.000.
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Mallory, Timothy P., Sr., 6,015,443, Cl. 55-302.000.
Merrill, David O.: *See—*
Barinaga, John A.; Clark, James E.; Merrill, David O.; Nguyen, Ngoc-Diep; and Otis, David R., Jr., 6,015,209, Cl. 347-86.000.
Merrill Lynch & Co., Inc.: *See—*
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Kang, Myung-Chol; Bray, Brian; Lichty, Maynard; Mader, Catherine; and Merutka, Gene, 6,015,881, Cl. 530-339.000.
Mesa, Carlos; and Mesa, Maritza. Wheelchair tilting device and method of tilting a wheelchair. 6,015,256, Cl. 414-678.000.
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Mesa, Carlos; and Mesa, Maritza, 6,015,256, Cl. 414-678.000.
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Schmidt, Hans Werner; Rahn, Martin; Stockhausen, Werner; Werner, Dietrich; and Hirsch, Martin, 6,015,539, Cl. 423-625.000.
Metlitsky, Boris: *See—*
Swartz, Jerome; Barkan, Edward; Spitz, Glenn S.; Katz, Joseph; and Metlitsky, Boris, 6,015,090, Cl. 235-472.000.
Metra Biosystems, Inc.: *See—*
Buhler, Joe P.; Butt, David; Goll, Jeffrey H.; Wagner, Neldon C.; and Whitney, Hartwell H., 6,015,383, Cl. 600-437.000.
Metrologic Instruments, Inc.: *See—*
Rockstein, George B.; Wilz, David M.; Colavito, Stephen J.; German, Gene; and Knowles, Carl Harry, 6,015,091, Cl. 235-472.010.
Metzger, Georges: *See—*
Reinehr, Dieter; Eckhardt, Claude; Hochberg, Robert; Kaufmann, Werner; and Metzger, Georges, 6,015,504, Cl. 252-8.910.
Meunier, Paul-Louis: *See—*
Scholz, Werner; Bachnick, Werner; Streckenbach, Wulf-Christian; Wessolly, Bernd; Voessing, Walter; Peters, Hartmut; Schroeder, Ernst F.; Timmermann, Friedrich; Meunier, Paul-Louis; and Artigalas, Max, 6,016,233, Cl. 360-15.000.
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Meyer, Ronald L.: *See—*
Kyle, Robert R.; Dixon, William F.; and Meyer, Ronald L., 6,016,304, Cl. 370-206.000.
Mheidle, Mickael: *See—*
Lacroix, Roger; Mheidle, Mickael; and Scheibli, Peter, 6,015,454, Cl. 106-31.470.
Miano, Joseph M.: *See—*
Olson, Eric N.; Li, Li; and Miano, Joseph M., 6,015,711, Cl. 435-375.000.
Michel, Patrick: *See—*
Benayoun, Alain; Le Pennec, Jean-Francois; and Michel, Patrick, 6,016,309, Cl. 370-252.000.
Micro-Mega International Manufactures: *See—*
Euvrard, Hubert; and Chevillot, Denis, 6,015,292, Cl. 433-102.000.
Micro Therapeutics, Inc.: *See—*
Greff, Richard J.; and Wallace, George, 6,015,541, Cl. 424-1.250.
Roth, Noah M., 6,015,433, Cl. 623-1.000.
Microchip Technology Incorporated: *See—*
Wojewoda, Igor, 6,016,019, Cl. 307-109.000.
MicroFab Technologies, Inc.: *See—*
Hayes, Donald J.; Boldman, Michael T.; and Shah, Virang G., 6,015,083, Cl. 228-254.000.
Micron Electronics, Inc.: *See—*
Boe, Craig L., 6,014,901, Cl. 73-831.000.
Micron Eletronics, Inc.: *See—*
Brunelle, Steven J., 6,015,046, Cl. 206-511.000.
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Akram, Salman; Farnworth, Warren M.; Wood, Alan G.; and Hembree, David R., 6,016,060, Cl. 324-757.000.
Becker, David S.; Blalock, Guy T.; and Roe, Fred L., 6,015,760, Cl. 438-714.000.
Fogal, Rich; and Ball, Michael B., 6,015,079, Cl. 228-4.100.
Hu, Yongjun; Pan, Pai-Hung; Ping, Er-Xuan; Thakur, Randhir P.S.; and DeBoer, Scott, 6,015,997, Cl. 257-412.000.
Keeth, Brent, 6,016,282, Cl. 365-233.000.
McTeer, Allen, 6,016,010, Cl. 257-764.000.
Moradi, Behnam; Raina, Kanwal K.; and Westphal, Michael J., 6,015,323, Cl. 445-24.000.
Parekh, Kunal R., 6,015,983, Cl. 257-296.000.
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Schrock, Ed A., 6,016,004, Cl. 257-676.000.
Schuegraf, Klaus F., 6,015,986, Cl. 257-303.000.
Shirley, Brian M.; Casper, Stephen L.; Lowrey, Tyler A.; and Duesman, Kevin G., 6,015,729, Cl. 438-239.000.
Zahorik, Russell C., 6,015,977, Cl. 257-4.000.
Microsoft Corporation: *See—*

Bosworth, Adam; Hunter, Ross A.; and Habib, David J., 6,016,488, Cl. 707-4.000.
Chu, Lon-Chan; Yaacovi, Yoram; and Settle, Kent F., 6,016,508, Cl. 709-223.000.
Facq, Jean-Remy; and Harris, Lindsay A., 6,016,520, Cl. 710-33.000.
Horvitz, Eric J.; Markley, Michael E.; and Sonntag, Martin L., 6,016,145, Cl. 345-342.000.
Lengyel, Jerome E.; and Snyder, John, 6,016,150, Cl. 345-426.000.
Saxton, Catherine J.; Saxton, Thomas W.; and Walker, Mark John, 6,016,492, Cl. 707-100.000.
Shaw, George H. J.; and Woodruff, Bryan A., 6,016,515, Cl. 709-301.000.
Suver, Christopher Allen, 6,016,497, Cl. 707-103.000.

MicroVention, Inc.: *See—*
Rosenbluth, Robert F.; Cox, Brian J.; and Greene, George R., Jr., 6,015,424, Cl. 606-200.000.

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Anzai, Masato; Mieki, Nariaki; and Toyosato, Yoshinari, 6,016,248, Cl. 361-683.000.

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Mih, Rebecca D.: *See—*
Wheeler, Donald C.; Gambino, Jeffrey P.; Hsu, Louis L.; Mandelman, Jack A.; and Mih, Rebecca D., 6,015,991, Cl. 257-336.000.

Mihara, Yasuhiro; Utagawa, Takashi; Yamada, Hideaki; and Asano, Yasuhisa, to Ajinomoto Co., Inc. Method for producing nucleoside-5'-phosphate ester. 6,015,697, Cl. 435-87.000.

Mikami, Noboru: *See—*
Horikawa, Tsuyosi; Makita, Tetsuro; Kuroiwa, Takeharu; Mikami, Noboru; and Shibano, Teruo, 6,015,989, Cl. 257-309.000.

Mikami, Shigeyuki: *See—*
Iio, Kenichi; Sakamoto, Koichi; Yamashita, Sadao; Hiratsuka, Toshihiro; Sonoda, Tomiya; and Mikami, Shigeyuki, 6,016,090, Cl. 333-202.000.

Mikami, Tomohisa: *See—*
Moroo, Jun; Mikami, Tomohisa; Mori, Masahiro; Chiba, Hirotaka; Nagata, Shigemi; Nakamura, Shigeyoshi; Konaka, Toshio; and Sato, Kazuhiko, 6,016,154, Cl. 345-442.000.

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Miles, Stewart David: *See—*
Henderson, David Sydney; McGinn, William Douglas; and Miles, Stewart David, 6,016,116, Cl. 342-64.000.

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Mimura, Hideki: *See—*
Kikuchi, Shinichi; Kitamura, Tetsuya; Mimura, Hideki; and Taira, Kazuhiko, 6,016,363, Cl. 382-232.000.
Kikuchi, Shinichi; Kitamura, Tetsuya; Mimura, Hideki; and Taira, Kazuhiko, 6,016,364, Cl. 382-232.000.
Taira, Kazuhiko; Kikuchi, Shinichi; Kurano, Tomoaki; Mimura, Hideki; and Hagio, Takeshi, 6,016,381, Cl. 386-95.000.

Minagawa, Kazuji: *See—*
Miwa, Makoto; Isomura, Shigenori; Muramatsu, Toshihiko; Minagawa, Kazuji; Matsuda, Takeshi; and Kato, Takahiko, 6,014,958, Cl. 123-520.000.

Minamishin, Hayato: *See—*
Kimura, Atsunori; Ono, Yoichi; Minamishin, Hayato; Tanaka, Yuji; Ohno, Seiichi; Hata, Hidekazu; Ueda, Hiroyuki; Esaki, Isamu; and Uchida, Atsushi, 6,015,147, Cl. 271-163.000.

Minato, Kazuaki: *See—*
Mitate, Takehito; Torata, Naoto; Minato, Kazuaki; Iida, Toyoshi; Makino, Tetsushi; Hamano, Shigeyuki; and Kameda, Naoyoshi, 6,015,637, Cl. 429-231.100.

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Minnich, Kristen Elaine: *See—*
Lassila, Kevin Rodney; Minnich, Kristen Elaine; and Carr, Richard Van Court, 6,015,852, Cl. 524-251.000.

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Hirai, Atsuto, 6,016,419, Cl. 399-390.000.
Kanbara, Tetsuro; and Ueyama, Masayuki, 6,016,231, Cl. 359-824.000.
Kobayashi, Nobuyuki; Hashimoto, Kiyofumi; and Hatano, Takuji, 6,015,507, Cl. 252-299.010.
Motosugi, Toshihisa, 6,016,209, Cl. 358-537.000.

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Bennett, C. Frank; and Mirabelli, Christopher K., 6,015,894, Cl. 536-24.500.

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Missry, Ezra, 6,014,775, Cl. 2-161.200.

Missotten, Bart M. A.: *See—*
Strubbe, Gilbert J. I.; and Missotten, Bart M. A., 6,014,903, Cl. 73-861.730.

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Iwasaki, Hiroaki; Watanabe, Yukimasa; Saitoh, Sakae; Matsumoto, Shyunichi; and Uchida, Maki, 6,015,646, Cl. 430-83.000.

Mitate, Takehito; Torata, Naoto; Minato, Kazuaki; Iida, Toyoshi; Makino, Tetsushi; Hamano, Shigeyuki; and Kameda, Naoyoshi, to Sharp Kabushiki Kaisha; and Tanaka Chemical Corporation. Process of producing lithium nickel oxide and nonaqueous secondary battery using the same. 6,015,637, Cl. 429-231.100.

Mitotix, Inc.: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
Ding, Lei, 6,016,068, Cl. 327-142.000.
Funabe, Chieko; Baba, Yoshimasa; Seno, Shoichiro; and Koui, Yuuji, 6,016,350, Cl. 380-49.000.
Horikawa, Tsuyosi; Makita, Tetsuro; Kuroiwa, Takeharu; Mikami, Noboru; and Shibano, Teruo, 6,015,989, Cl. 257-309.000.
Kogure, Eiji; Fukushima, Tadashi; Tsukahara, Hiroaki; Imai, Toshihisa; Oshima, Takao; and Kaga, Kunihiko, 6,015,008, Cl. 165-185.000.
Matsubara, Kimikatsu, 6,016,521, Cl. 710-34.000.
Miura, Kazunori; Takagi, Masanori; Kifuku, Takayuki; and Ohtagaki, Shigeki, 6,016,042, Cl. 318-430.000.
Miyazaki, Yoko; Hattori, Nobuyoshi; Izumitani, Junko; and Ikeno, Masahiko, 6,016,562, Cl. 714-724.000.
Mizuta, Masaharu, 6,016,061, Cl. 324-762.000.
Nakamura, Mitsuyoshi, 6,015,994, Cl. 257-380.000.
Suzuki, Kazumasa; Mohri, Atsushi; Yamada, Akira; and Yoshida, Toyohiko, 6,016,543, Cl. 712-233.000.
Tsutsui, Toshikazu; and Furuta, Masaaki, 6,016,278, Cl. 365-200.000.

Mitsubishi Electric Home Appliance Co., Ltd.: *See—*
Kogure, Eiji; Fukushima, Tadashi; Tsukahara, Hiroaki; Imai, Toshihisa; Oshima, Takao; and Kaga, Kunihiko, 6,015,008, Cl. 165-185.000.

Mitsubishi Electric Semiconductor Systems Corporation: *See—*
Matsubara, Kimikatsu, 6,016,521, Cl. 710-34.000.

Mitsuhashi, Masaaki: *See—*
Sawai, Kunio; Morinaka, Koji; and Mitsuhashi, Masaaki, 6,016,235, Cl. 360-85.000.

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Morizono, Kenichi; Okada, Keiji; Shigemoto, Hiromi; and Kawachi, Hideshi, 6,015,625, Cl. 428-500.000.

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Matsumiya, Sadayuki; and Miyamoto, Shigeo, 6,014,816, Cl. 33-503.000.

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Miura, Takeo, to Advantest Corporation. Semiconductor device testing apparatus. 6,016,565, Cl. 714-736.000.

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Miyamoto, Tadaomi; and Miyamoto, Koho, 6,015,835, Cl. 514-562.000.

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Matsumiya, Sadayuki; and Miyamoto, Shigeo, 6,014,816, Cl. 33-503.000.

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Arami, Junichi; Ono, Hiroo; Kondo, Tomomi; and Miyata, Koji, 6,014,943, Cl. 118-723.00E.

Miyazaki, Ken: *See*—
Yamagishi, Toru; Miyazaki, Ken; and Yokouchi, Kentaro, 6,016,382, Cl. 386-109.000.

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Okabayashi, Takahiro; Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Terayama, Yoshimi; Sakaki, Takashi; Ikegami, Yuichi; Kondo, Kazuo; Tamura, Yoichi; and Nakatsuka, Yasuo, 6,015,081, Cl. 228-180.220.

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Mizoshita, Yoshifumi; Yamada, Tomoyoshi; Kuroba, Yasumasa; Kouhei, Toru; Sugawara, Takao; Matsumoto, Masaru; Mase, Hiroyuki; Tsunekewa, Masao; Koganezawa, Shinji; and Aruga, Keiji, to Fujitsu Limited. Shaft construction of a disk drive. 6,016,237, Cl. 360-97.010.

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Amano, Yasunobu; Ichida, Koji; Endo, Naruhiko; Ohshige, Yoichi; and Mizuki, Masahiko, 6,016,030, Cl. 313-414.000.

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Naruo, Takeshi; Saito, Takeshi; and Noguchi, Shuichi, 6,014,887, Cl. 73-12.040.

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Mizuta, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Cantilever type probe needle for probe card and method of fabrication and control thereof. 6,016,061, Cl. 324-762.000.

Mizutani, Shinji, to Nikon Corporation. Alignment device and method with focus detection system. 6,016,186, Cl. 355-53.000.

Mizutani, Tsuyoshi: *See*—
Oku, Teruo; Kayakiri, Hiroshi; Abe, Yoshito; Sawada, Yuki; and Mizutani, Tsuyoshi, 6,015,818, Cl. 514-312.000.

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Cirelli, Raymond Andrew; Mkrtchyan, Masis; Trimble, Lee Edward; Watson, George Patrick; and Windt, David Lee, 6,015,644, Cl. 430-30.000.

Mo, Larry Y. L. Method and apparatus for improving sidelobe performance of sparse array using harmonic imaging. 6,014,897, Cl. 73-628.000.

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Golub, Lorne M.; Ritchlin, Christopher T.; Greenwald, Robert A.; Haas-Smith, Sally; Moak, Susan A.; and Lee, Hsi-Ming, 6,015,804, Cl. 514-152.000.

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Stoll, Kurt; Mödinger, Uwe; and Waldmann, Dieter, 6,014,924, Cl. 92-13.500.

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Burns, William K.; and Moeller, Robert P., 6,016,198, Cl. 356-345.000.

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Nguyen, Hungviet H.; and Moledina, Riaz A., 6,016,360, Cl. 382-166.000.

Molex Incorporated: *See*—
Tojo, Katsutoshi, 6,015,310, Cl. 439-260.000.
Walse, Alan S.; Lang, Harold Keith; Panella, Augusto P.; Triner, Irvin R.; and Tung, Shyh-Lin, 6,015,299, Cl. 439-60.000.
Yagi, Masanori; Noda, Atsuhito; Ichijo, Yasuhiro; and Hirata, Hideyuki, 6,015,304, Cl. 439-108.000.

Molinari, Lou; Gooderum, Steve; Peckholdt, Keith; DiMarco, Frank; Jackson, Michael; DePoalo, Ron; Makhijani, Sunil; Chung, Jennifer; Chou, Winnie; and Gould, Mary Beth, to Merrill Lynch & Co., Inc. Enhanced collateralized funding processor. 6,016,482, Cl. 705-35.000.

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Eaton, Gerald B.; Monahan, Michael J.; and Tipton, Robert J., 6,015,779, Cl. 508-591.000.

Mondro, Frederick A.: *See*—
Carruth, Cary; Mondro, Frederick A.; Peralta, John J.; Pelletier, Robert; and Kovacs, Nickolas, 6,015,175, Cl. 294-65.500.

Monia, Brett P.; Baker, Brenda F.; Zhang, Hong; and Cowsert, Lex M., to Isis Pharmaceuticals Inc. Antisense modulation of FADD expression. 6,015,712, Cl. 435-375.000.

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Kaniewski, Wojciech Kazimierz; Lodge, Jennifer Katherine; and Tumer, Nilgun Ereken, 6,015,940, Cl. 800-279.000.

Montalbano, Anthony J.: *See*—
Heenan, Sidney A.; Montalbano, Anthony J.; Coman, Liviu A.; and Couzin, Dennis I., 6,015,214, Cl. 359-529.000.

Montano, Cesar A.: *See*—
Langford, Gordon B.; Montano, Cesar A.; Odom, Doug; Danielson, Thomas; Allen, Richard; Putnam, Greg; and Beck, David, 6,015,163, Cl. 280-735.000.

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Kerr, Andrew, 6,015,422, Cl. 606-191.000.

Moody, Terry: *See*—
John, Christy S.; Baumgold, Jesse; McAfee, John G.; Moody, Terry; and Bowen, Wayne, 6,015,543, Cl. 424-1.810.

Moore, Andrew J., to Cielo Communications, Inc. Passively aligned optoelectronic coupling assembly. 6,015,239, Cl. 385-92.000.

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Sanchez, Michael; Khatib, Khaled M.; and Rice, David K., II, 6,015,615, Cl. 428-352.000.

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Cannon, Terry K.; and Sharp, Tricia E., 6,015,085, Cl. 229-305.000.

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Edwards, Jeffrey Charles; and Morgan, Michael Graham, 6,015,013, Cl. 166-360.000.

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Okada, Masahiko; Ban, Takashi; Hirose, Tatsuya; Yagi, Kiyoshi; Hoshino, Tatsuyuki; Mori, Hidefumi; Okabe, Takanori; and Hoshino, Nobuaki, 6,015,349, Cl. 464-31.000.

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Yamaguchi, Masayuki; Yamashita, Yukihide; and Mori, Kenichiro, 6,015,585, Cl. 427-8.000.

Mori, Makoto: *See*—
Sakurai, Yoshito; Ohtsuki, Kenichi; Gohara, Shinobu; Mori, Makoto; Horiki, Akira; Kato, Takao; and Kuwahara, Hiroshi, 6,016,317, Cl. 370-391.000.

Mori, Masahiro: *See*—
Moroo, Jun; Mikami, Tomohisa; Mori, Masahiro; Chiba, Hirotaka; Nagata, Shigemi; Nakamura, Shigeyoshi; Konaka, Toshio; and Sato, Kazuhiko, 6,016,154, Cl. 345-442.000.

Mori, Takahiro, to Konica Corporation. Method of manufacturing support for planographic printing plate. 6,015,649, Cl. 430-193.000.

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Morimoto, Kiyoshi: *See*—
Yuki, Koichiro; Morita, Kiyoyuki; Morimoto, Kiyoshi; and Hirai, Yoshihiko, 6,015,978, Cl. 257-25.000.

Morin, Alexandre Guy Georges: *See*—
Kephart, Jeffrey Owen; Morin, Alexandre Guy Georges; Sorkin, Gregory Bret; and Wells, Joseph Warreb, 6,016,546, Cl. 713-200.000.

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Sawai, Kunio; Morinaka, Koji; and Mitsuhashi, Masaaki, 6,016,235, Cl. 360-85.000.

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Haneda, Isamu; Kihara, Yoshiro; and Morioka, Masami, 6,016,502, Cl. 707-509.000.

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Yuki, Koichiro; Morita, Kiyoyuki; Morimoto, Kiyoshi; and Hirai, Yoshihiko, 6,015,978, Cl. 257-25.000.

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Kimura, Yoshio; Morita, Satoshi; Matsuyama, Yuji; and Semba, Norio, 6,015,066, Cl. 222-64.000.

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Sato, Osamu; Sugimoto, Kiyoshi; Moriya, Yoshihito; Iden, Noriyuki; Kikuoka, Shinitiro; and Hasegawa, Tadao, 6,014,952, Cl. 123-90.170.

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Kuzumaki, Yoshihiro; Moriyama, Iwao; and Okabe, Jun, 6,015,860, Cl. 525-123.000.

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Amano, Tetsuya; Hotta, Yoshihiko; Morohoshi, Kunichika; and Suzuki, Kazumi, 6,015,770, Cl. 503-201.000.

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Wilson, Nick; and Thibideau, Frank, 6,014,829, Cl. 40-753.000.

Morse, Wayne, to Sun Microsystems, Inc. Lighting unit for a three-dimensional graphics accelerator with improved processing of multiple light sources. 6,016,149, Cl. 345-426.000.

Morton, Kevin John: *See—*
Brown, Gerald Ivan; Morton, Kevin John; and Flannigan, Martin John, 6,015,441, Cl. 44-393.000.

Moses, John: *See—*
Gusmeri, Val J.; Moses, John; and Burnison, Roger, 6,014,939, Cl. 114-230.120.

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Mossbrucker, Mark: *See—*
Marelin, Miklos; Mossbrucker, Mark; Hinnen, Hans R.; and Whalen, John E., Jr., 6,014,792, Cl. 24-20.00R.

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Motorola, Inc.: *See—*
Bartusiak, Paul John, 6,016,422, Cl. 455-76.000.
Claisse, Paul Robert; and Kiely, Philip Anthony, 6,016,326, Cl. 372-44.000.
Cook, Steven R., 6,016,511, Cl. 709-236.000.
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Kadanka, Petr; and Rozsypal, Antonin, 6,016,017, Cl. 307-64.000.
Kampe, Frederick Loring; Smith, Scott Christopher; Dorenbosch, Jheroen Pieter; and Nelms, Robert Nathan, 6,016,107, Cl. 340-825.440.
Malone, Hugh Robert; Dendy, Deborah Sue; Cook, Dean Lawrence; Phillips, James R.; and Kommrusch, Richard S., 6,016,122, Cl. 342-372.000.
Morris, Garron, 6,015,263, Cl. 416-132.00A.
Peterson, William M.; and Chen, Eugene Y., 6,016,269, Cl. 365-171.000.
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Basora, Sanjuan Antonio; and Arnedo, Julian, 6,014,925, Cl. 99-327.000.

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Streinz, Christopher C.; Neville, Matthew; Grumbine, Steven K.; and Mueller, Brian L., 6,015,506, Cl. 252-186.100.

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Plog, Carsten; Andorf, Renato; Mueller, Ralf; Schaefer, Wolfgang; and Kayser, Armin, 6,015,483, Cl. 205-763.000.

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Meyer, Ronald K., Jr.; Vaidyanathan, Mohan; Pekny, William; Griffith, Gerald P.; and Mui, Peter H., 6,016,214, Cl. 359-237.000.

Muirhead, Andrew: *See—*
Starke, Henry; and Muirhead, Andrew, 6,016,016, Cl. 307-9.100.

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Ghilardelli, Andrea; Mulatti, Jacopo; and Branchetti, Maurizio, 6,016,073, Cl. 327-536.000.

Muller, Ernst R.; Muller, Michael R.; and Cencich, Steve J. Dry material and slurry processor. 6,015,228, Cl. 366-186.000.

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Kaiser, Heinz-Peter; Richter, Klaus-Jürgen; and Müller, Niclas, 6,015,448, Cl. 75-560.000.

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Kataoka, Hideo; Shigeno, Nobuyuki; Munakata, Masaki; and Urabe, Tetsuo, 6,016,178, Cl. 349-117.000.

Mundon, Christopher Cyril, to Stein Atkinson Stordy Limited. Oven for glass article. 6,015,288, Cl. 432-212.000.

Muneaux, Claude: *See—*
Ferrari, Bernard; Gougat, Jean; Muneaux, Claude; Muneaux, Yvette; Perreaut, Pierre; and Planchenault, Claudine, 6,015,812, Cl. 514-235.800.

Muneaux, Yvette: *See—*
Ferrari, Bernard; Gougat, Jean; Muneaux, Claude; Muneaux, Yvette; Perreaut, Pierre; and Planchenault, Claudine, 6,015,812, Cl. 514-235.800.

Munns, Gordon Richard: *See—*
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McDonald, Ian Alexander; Albrecht, Elisabeth; and Munoz, Benito, 6,015,879, Cl. 530-331.000.

Muramatsu, Toshihiko: *See—*
Miwa, Makoto; Isomura, Shigenori; Muramatsu, Toshihiko; Minagawa, Kazuji; Matsuda, Takeshi; and Kato, Takahiko, 6,014,958, Cl. 123-520.000.

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Fujino, Masaru, 6,016,088, Cl. 333-147.000.
Hidaka, Seiji; Matsui, Norifumi; Kubota, Kazuhiko; and Ise, Tomoyuki, 6,016,091, Cl. 333-202.000.
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Kaida, Hiroaki, 6,014,799, Cl. 29-25.350.
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Unami, Toshihiko; Inoue, Jiro; Yamamoto, Takashi; and Takeshima, Tetsuo, 6,016,024, Cl. 310-345.000.

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Noguchi, Minori; Kenbo, Yukio; Oshida, Yoshitada; Shiba, Masataka; Yoshitaka, Yasuhiro; and Murayama, Makoto, 6,016,187, Cl. 355-53.000.

Murdin, Andrew: *See—*
Loosmore, Sheena; Harkness, Robin; Schryvers, Anthony; Chong, Pele; Gray-Owen, Scott; Yang, Yan-Ping; Murdin, Andrew; and Klein, Michel, 6,015,688, Cl. 435-69.100.

Murdock, Douglas R.: *See—*
Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; Goodman, Todd A.; Vercande, David J.; Tangeman, Michael R.; Busch, Eric M.; Kripakaran, Raghavan; Jayasimha, Madhigubba G.; Smith, Keith E.; Austin, Mark A.; and Berry, Dana Bruce, 6,016,343, Cl. 379-242.000.

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Noritake, Yuji; Murobushi, Hisako; and Hori, Hajime, 6,014,888, Cl. 73-23.350.

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Murray, Elizabeth E.: *See—*
Adang, Michael J.; and Murray, Elizabeth E., 6,015,891, Cl. 536-23.710.

Murry, Lynn E.: *See—*

Hawkins, Phillip R.; Bandman, Olga; and Murry, Lynn E., 6,015,883, Cl. 530-351.000.
Murti, Dasarao K.; and Foucher, Daniel A., to Xerox Corporation. Photoconductive imaging members. 6,015,645, Cl. 430-59.000.
Musa, Lorenzo. Cellular phone provided with legal identification means of the owner of the cellular phone. 6,016,349, Cl. 380-23.000.
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Crookham, Joe P.; Brackett, William E.; DeJong, Mark A.; and Barker, David L., 6,016,389, Cl. 395-500.010.
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Jacobs, William R., Jr.; Musser, James M.; and Telenti, Amalio, 6,015,890, Cl. 536-23.700.
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Guzik, Andrew T.; Ellis, David L.; Yorio, Rudy; Pratt, Steven D.; and Muthuswamy, Sivakumar, 6,015,970, Cl. 250-229.000.
Muto, Tadashi: *See—*
Seki, Koichi; Wada, Takeshi; Muto, Tadashi; Shoji, Kazuyoshi; Kubota, Yasurou; and Kume, Hitoshi, 6,016,273, Cl. 365-185.220.
MVS, Incorporated: *See—*
Bodell, Donald H., 6,016,426, Cl. 455-422.000.
Mycogen Plant Science, Inc.: *See—*
Adang, Michael J.; and Murray, Elizabeth E., 6,015,891, Cl. 536-23.710.
Myers, Mark S.: *See—*
Quattromani, Marc Alan; and Myers, Mark S., 6,016,510, Cl. 709-233.000.
Myron, James R.: *See—*
Schneider, William A., Jr.; Pham, L. Don; and Myron, James R., 6,016,462, Cl. 702-14.000.
Myrto, Glenn Edward: *See—*
Brodsky, William Louis; Chan, Benson; Myrto, Glenn Edward; and Sherman, John Henry, 6,015,301, Cl. 439-73.000.
Na, Henry Cheng: *See—*
Petri, Marco; and Na, Henry Cheng, 6,015,782, Cl. 510-379.000.
Naba, Masahiro: *See—*
Yoshikawa, Shouichi; Yukino, Shinya; and Naba, Masahiro, 6,016,238, Cl. 360-99.080.
Nagai, Hiromi: *See—*
Yano, Toshiyuki; Kojima, Hitoshi; Hiraoka, Eisuke; Chujo, Akihiko; Watanabe, Kaoru; Nagai, Hiromi; Endo, Yasuharu; and Hashimoto, Ken, 6,015,455, Cl. 106-31.580.
Nagami, Ken, to Konica Corporation. Tabular silica dispersion and silver halide photographic light sensitive material. 6,015,656, Cl. 430-531.000.
Nagano, Naoki: *See—*
Terasawa, Hideo; Kondo, Yoshio; Nagano, Naoki; and Sawai, Kunihito, 6,016,139, Cl. 345-169.000.
Nagano, Yoshihisa: *See—*
Arita, Koji; Fujii, Eiji; Shimada, Yasuhiro; Uemoto, Yasuhiro; Nasu, Toru; Matsuda, Akihiro; Nagano, Yoshihisa; Inoue, Atsuo; Matsuura, Taketoshi; and Otsuki, Tatsuo, 6,015,987, Cl. 257-303.000.
Nagaoka, Teruji: *See—*
Hirotsu, Takashi; Ohtani, Kazuyoshi; and Nagaoka, Teruji, 6,014,873, Cl. 65-104.000.
Nagasawa, Koichi; Kawaguchi, Naomi; Shimai, Futoshi; Sato, Mitsuru; Harada, Kouji; and Koshiyama, Jun, to Tokyo Ohka Kogyo Co., Ltd. Method of removing coating from edge of substrate. 6,015,467, Cl. 134-1.000.
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Nagata, Shigemi: *See—*
Moroo, Jun; Mikami, Tomohisa; Mori, Masahiro; Chiba, Hirotaka; Nagata, Shigemi; Nakamura, Shigeyoshi; Konaka, Toshio; and Sato, Kazuhiko, 6,016,154, Cl. 345-442.000.
Naglieri, James W.: *See—*
Savino, John E.; Gallagher, Thomas P.; Macy, Barbara Reid; Scully, Michael John; Toney, Elizabeth D.; Harlow, Ernest R.; and Naglieri, James W., 6,015,167, Cl. 283-67.000.
Nagoya Screw Mfg. Co., Ltd.: *See—*
Ohkoshi, Yasumitsu; and Naito, Fumihito, 6,015,411, Cl. 606-80.000.
Nair, Ravinder: *See—*
Castillo, Richard; Nair, Ravinder; Srinivasan, Krishna; and Villela, Edward C., 6,015,343, Cl. 454-365.000.
Naito, Fumihito: *See—*
Ohkoshi, Yasumitsu; and Naito, Fumihito, 6,015,411, Cl. 606-80.000.
Naka, Yoichi: *See—*
Ishibuchi, Seigo; Morimoto, Hiroshi; Fukunari, Atsushi; Inoue, Hiroyoshi; and Naka, Yoichi, 6,015,829, Cl. 514-404.000.
Nakada, Kazuhiko; and Sugiyama, Akihisa, to Menicon Co., Ltd. Ring for a hard contact lens and hard contact lens composite employing such a ring. 6,015,213, Cl. 351-172.000.
Nakagawa, Etsuo: *See—*
Ohnishi, Noriyuki; Takeuchi, Hiroyuki; Miyazawa, Kazutoshi; Hachiya, Norihisa; and Nakagawa, Etsuo, 6,015,508, Cl. 252-299.630.
Nakahanada, Manabu; and Satake, Wataru, to Konica Corporation. Method for processing transparent silver halide photographic light-sensitive material and product thereby. 6,015,653, Cl. 430-393.000.
Nakamura, Akihiro; Kato, Masayoshi; Takahashi, Taro; and Maeda, Hirokazu, to Fuji Oil Co., Ltd. Process for producing emulsifiers, and emulsified compositions. 6,015,840, Cl. 516-270.000.
Nakamura, Hidehiro; Satou, Kazuki; and Oguchi, Wataru, to Alps Electric Co., Ltd. PC card connector. 6,015,309, Cl. 439-159.000.
Nakamura, Kazuhiro: *See—*
Hoshiba, Akihiko; and Nakamura, Kazuhiro, 6,015,317, Cl. 440-1.000.
Nakamura, Kazushige: *See—*
Anayama, Hideki; Maruyama, Akio; and Nakamura, Kazushige, 6,016,414, Cl. 399-159.000.
Nakamura, Masao; and Takagishi, Yukio, to Nippon Zeon Co., Ltd. Rubber composition. 6,015,850, Cl. 524-188.000.
Nakamura, Mitsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device and manufacturing method thereof. 6,015,994, Cl. 257-380.000.
Nakamura, Nobuhiro: *See—*
Endo, Yukio; Nakamura, Nobuhiro; and Ogo, Ikuo, 6,016,174, Cl. 349-43.000.
Nakamura, Nobutaka; and Yamaki, Masayo, to Kabushiki Kaisha Toshiba. Apparatus for controlling duty ratio of power saving of CPU. 6,016,548, Cl. 713-323.000.
Nakamura, Shigeyoshi: *See—*
Moroo, Jun; Mikami, Tomohisa; Mori, Masahiro; Chiba, Hirotaka; Nagata, Shigemi; Nakamura, Shigeyoshi; Konaka, Toshio; and Sato, Kazuhiko, 6,016,154, Cl. 345-442.000.
Nakamura, Tohru: *See—*
Mizuno, Osamu; Enshu, Hisayuki; and Nakamura, Tohru, 6,016,239, Cl. 360-104.000.
Nakamura, Yasushi, to Hirose Co., Ltd. Fish tank with illuminating light guide device. 6,015,216, Cl. 362-96.000.
Nakamura, Yoshihisa: *See—*
Kamei, Yasuo; Kawaguchi, Takazo; Yamaoka, Hideyuki; and Nakamura, Yoshihisa, 6,015,527, Cl. 266-145.000.
Nakanishi, Hidefumi: *See—*
Sasaki, Yutaka; Nakanishi, Hidefumi; and Tanaka, Hiroaki, 6,016,087, Cl. 333-116.000.
Nakanishi, Tosaki: *See—*
Stoler, Gil; and Nakanishi, Tosaki, 6,016,551, Cl. 713-601.000.
Nakano, Minoru: *See—*
Fukumoto, Hirohide; Ushirono, Junichi; Nakano, Minoru; and Kataoka, Hideo, 6,016,179, Cl. 349-128.000.
Nakano, Tadashi: *See—*
Leung, Roger Y.; and Nakano, Tadashi, 6,015,457, Cl. 106-287.160.
Nakao, Masayuki: *See—*
Hatakeyama, Masahiro; Ichiki, Katsunori; Kato, Takao; Hatamura, Yotaro; and Nakao, Masayuki, 6,015,976, Cl. 250-492.230.
Nakase, Ryoichi: *See—*
Ozawa, Sigeyuki; and Nakase, Ryoichi, 6,015,321, Cl. 440-88.000.
Nakashima, Takuji: *See—*
Kawazu, Yukio; Suzuki, Toshimitsu; Yuasa, Masayuki; Yokomizo, Yuichi; Majima, Toshiro; Ito, Takao; Nakashima, Takuji; and Nozawa, Akira, 6,015,925, Cl. 564-316.000.
Nakasuji, Mamoru, to Nikon Corporation. Mask used in charged particle beam projecting apparatus. 6,015,643, Cl. 430-5.000.
Nakatsuka, Yasuo: *See—*
Okabayashi, Takahiro; Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Terayama, Yoshimi; Sakaki, Takashi; Ikegami, Yuichi; Kondo, Kazuo; Tamura, Yoichi; and Nakatsuka, Yasuo, 6,015,081, Cl. 228-180.220.
Nakayama, Sanchi: *See—*
Koido, Yasuhiro; and Nakayama, Sanchi, 6,016,369, Cl. 382-298.000.
Namiki, Mitsuru, to Olympus Optical Co., Ltd. Multiple image optics system. 6,016,224, Cl. 359-619.000.
Nanami, Masayoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Oil cooler for watercraft. 6,015,320, Cl. 440-88.000.
Nanami, Shoji: *See—*
Ito, Wataru; Yasuda, Hiroaki; and Nanami, Shoji, 6,016,356, Cl. 382-132.000.
Nandram, Kamal Roy: *See—*
Dubé , Jean-Guy; and Nandram, Kamal Roy, 6,015,135, Cl. 254-1.000.
Narang, Subhash C.: *See—*
Ventura, Susanna C.; Narang, Subhash C.; Hum, Georgina; Liu, Peikang; Ranganathan, Prema; and Sun, Luying, 6,015,638, Cl. 429-307.000.
Narasimhan, Mandayam Jeersannidhi, Jr.: *See—*
Thirumalachar, Mandayam Jeersannidhi; and Narasimhan, Mandayam Jeersannidhi, Jr., 6,015,808, Cl. 514-192.000.
Narayana, Pidugu L.: *See—*
Hawkins, Andrew L.; and Narayana, Pidugu L., 6,016,403, Cl. 395-877.000.
Nariani, Subhash R.: *See—*
Williamson, Jon Roderick; and Nariani, Subhash R., 6,015,732, Cl. 438-253.000.
Narita, Masaki, to Suzuki Motor Corporation. Method and apparatus for controlling the air-fuel ratio in an internal combustion engine. 6,014,963, Cl. 123-674.000.
Naruki, Kenichi: *See—*
Chambers, Richard G.; and Naruki, Kenichi, 6,015,205, Cl. 347-37.000.
Naruo, Takeshi; Saito, Takeshi; and Noguchi, Shuichi, to Mizuno Corporation. Shaft selection aiding apparatus for selecting optimum shaft for a golfer. 6,014,887, Cl. 73-12.040.
Nassiff, Amado: *See—*
Fado, Frank; Guasti, Peter; Nassiff, Amado; and VanBuskirk, Ronald, 6,016,136, Cl. 345-133.000.
Nasu, Toru: *See—*
Arita, Koji; Fujii, Eiji; Shimada, Yasuhiro; Uemoto, Yasuhiro; Nasu, Toru; Matsuda, Akihiro; Nagano, Yoshihisa; Inoue, Atsuo; Matsuura, Taketoshi; and Otsuki, Tatsuo, 6,015,987, Cl. 257-303.000.

Natarajan, Balas K.: *See*—
Konstantinides, Kontantinos; Natarajan, Balas K.; and Yovanof, Gregory S., 6,016,366, Cl. 382-260.000.

Natchus, Michael George: *See*—
Wang, Zhe; Almstead, Neil Gregory; Bradley, Rimma Sandler; Natchus, Michael George; De, Biswanath; Pikul, Stanislaw; and Taiwo, Yetunde Olabisi, 6,015,912, Cl. 548-408.000.

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Antaki, James F.; Paden, Bradley; Burgreen, Gregory; and Groom, Nelson, 6,015,272, Cl. 417-356.000.

National Instruments Corporation: *See*—
Knudsen, Niels, 6,016,112, Cl. 341-118.000.

National Research Council of Canada: *See*—
Rioux, Marc; and Paquet, Eric, 6,016,487, Cl. 707-2.000.

National Semiconductor Corporation: *See*—
Can, Sümer, 6,016,051, Cl. 323-315.000.
Shay, Michael John, 6,016,071, Cl. 327-294.000.

National Tool & Manufacturing Co.: *See*—
Mattia, Daniel, 6,015,283, Cl. 425-556.000.

National University of Singapore: *See*—
Chung, Tai-Shung; Hu, Xudong; and Teoh, Soo Khean, 6,015,516, Cl. 264-41.000.

Natsu Maruyama: *See*—
Suzuki, Fujio; Sasaki, Hidetaka; and Kobayashi, Makiko, 6,015,796, Cl. 514-45.000.

Naumann, Dirk: *See*—
Görge, Astrid; Meese-Marktscheffel, Juliane; Naumann, Dirk; Olbrich, Armin; and Schrumpf, Frank, 6,015,447, Cl. 75-255.000.

Navartis AG: *See*—
Chaouk, Hassan; Meijs, Gordon Francis; and Laycock, Bronwyn Glenice, 6,015,609, Cl. 428-308.400.

Navistar International Transportation Corp: *See*—
Isaac, Emad S.; and Iwaszkiewicz, Titus J., 6,016,459, Cl. 701-102.000.
Oleksiewicz, Radek A., 6,014,960, Cl. 123-568.200.

Nealon, John: *See*—
Sullivan, Michael J.; Nealon, John; Binette, Mark; and Nesbitt, Dennis, 6,015,356, Cl. 473-373.000.

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Baba, Mikio, 6,016,013, Cl. 257-778.000.
Fuji, Yukio, 6,016,276, Cl. 365-189.070.
Fujiwara, Ryuhei, 6,016,567, Cl. 714-748.000.
Hongu, Takahiro; and Hirao, Kouichirou, 6,016,361, Cl. 382-209.000.
Iwasaki, Motoya, 6,016,329, Cl. 375-340.000.
Koido, Yasuhiro; and Nakayama, Sanchi, 6,016,369, Cl. 382-298.000.
Maesako, Taketo; Yamamoto, Kouki; Matsui, Yoshinori; and Sakakibara, Kenichi, 6,016,280, Cl. 365-226.000.
Ohtsuki, Michihito, 6,016,106, Cl. 340-825.440.
Saeki, Takanori, 6,016,064, Cl. 326-121.000.
Satoh, Shunji, 6,016,083, Cl. 333-12.000.
Tomoike, Hiroyuki, 6,016,318, Cl. 370-401.000.
Uemura, Hideaki, 6,016,003, Cl. 257-666.000.
Yamamori, Manabu, 6,016,074, Cl. 327-541.000.
Yoshida, Hiroshi, 6,015,726, Cl. 438-202.000.

NEC Research Institute, Inc.: *See*—
Ghaemi, Hadi F.; Li, Yao; Thio, Tineke; and Wang, Ting, 6,016,376, Cl. 385-116.000.

Neff, Edward A.; Sheaffer, Michael S.; Ferris, Michael A.; Huang, David; Haidos, Steven; Boyle, Kieran; and Stom, Dennis, to Systems, Machines, Automation Components Corporation. Control processes for linear voice coil actuator. 6,016,039, Cl. 318-115.000.

Nehring, Rudolf: *See*—
Gubisch, Dietmar; Armbrust, Klaus; Kaizik, Alfred; Scholz, Bernhard; and Nehring, Rudolf, 6,015,928, Cl. 568-882.000.

Neidhart, Marie-Paule Heitz: *See*—
Alanine, Alexander; Büttelmann, Bernd; Neidhart, Marie-Paule Heitz; Pinard, Emmanuel; and Wyler, René, 6,015,824, Cl. 514-375.000.

Nelms, Robert Nathan: *See*—
Kampe, Frederick Loring; Smith, Scott Christopher; Dorenbosch, Jheroen Pieter; and Nelms, Robert Nathan, 6,016,107, Cl. 340-825.440.

Nelson, Patrick: *See*—
Roslund, Richard N., Jr.; Nelson, Patrick; Wilkerson, Larry Allen; Roark, Troy; Dral, Joel; Simpson, Steve; and Clark, John, 6,015,187, Cl. 297-300.400.

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Petersen, Carolyn; Leech, James; Nelson, Richard C.; and Gut, Jiri, 6,015,882, Cl. 530-350.000.

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Lin, Tao, 6,016,151, Cl. 345-430.000.

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Theodore, Louis J.; Kasina, Sudhakar; Reno, John M.; and Gustavson, Linda M., 6,015,897, Cl. 540-474.000.

Nepsund, Larry R.; Abrahamson, Kathleen A.; Boeckermann, Thomas A.; and Elfstrand, James K., to Donaldson Company, Inc. Method of servicing an air cleaner and of filtering engine intake air using prefilter arrangements. 6,015,452, Cl. 95-287.000.

Nesbitt, Dennis: *See*—
Sullivan, Michael J.; Nealon, John; Binette, Mark; and Nesbitt, Dennis, 6,015,356, Cl. 473-373.000.

Neskovic, Milorad: *See*—
Hecht, Kurt; Neskovic, Milorad; Shreesha, Vasanth; and Cohen, Edward, 6,015,089, Cl. 235-462.160.

Ness, Richard M.; Partlo, William N.; and Sandstrom, Richard L., to Cymer, Inc. Magnetic modulator voltage and temperature timing compensation circuit. 6,016,325, Cl. 372-38.000.

Neste Oy: *See*—
Suntola, Tuomo; and Lindfors, Sven, 6,015,590, Cl. 427-255.230.

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Yuan, Jun; and Chen, Xi, 6,015,900, Cl. 544-380.000.

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Fischell, Robert E.; Fischell, David R.; and Upton, Adrian R. M., 6,016,449, Cl. 607-45.000.

Nevill, Gary John: *See*—
Elliott, Terrence Charles; Nevill, Gary John; Byrne, Ian Kenneth; Adams, Anthony Mason; Courtney, M Lyle; and Spencer, David, 6,015,248, Cl. 408-204.000.

Neville, Matthew: *See*—
Streinz, Christopher C.; Neville, Matthew; Grumbine, Steven K.; and Mueller, Brian L., 6,015,506, Cl. 252-186.100.

New England Medical Center Hospitals, Inc.: *See*—
Potter, David A.; and Skolnik, Paul R., 6,015,787, Cl. 514-12.000.

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Strubbe, Gilbert J. I.; and Missotten, Bart M. A., 6,014,903, Cl. 73-861.730.

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Etlinger, Joseph D.; and Zeman, Richard J., 6,015,837, Cl. 514-653.000.

New York University: *See*—
John, Erwin Roy, 6,016,444, Cl. 600-544.000.

Newcan Co., Inc., The: *See*—
Gagnon, Louis R.; Pope, William P., Jr.; and Marson, Richard H., 6,014,988, Cl. 138-168.000.

Newcastle University Ventures Limited: *See*—
Griffin, Roger John; Calvert, Alan Hilary; Curtin, Nicola Jane; Newell, David Richard; and Golding, Bernard Thomas, 6,015,827, Cl. 514-394.000.

Newcombe, Russell Ley: *See*—
Cink, Kimberly Ann; and Newcombe, Russell Ley, 6,016,514, Cl. 709-300.000.

Newell, David Richard: *See*—
Griffin, Roger John; Calvert, Alan Hilary; Curtin, Nicola Jane; Newell, David Richard; and Golding, Bernard Thomas, 6,015,827, Cl. 514-394.000.

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Williamson, John M.; Guterman, Alexandre J.; Zani, Robert; Newell, Terry; and Brown, Anthony K. Dale, 6,016,086, Cl. 333-109.000.

Newell, Vincent J.: *See*—
Kafka, James; Newell, Vincent J.; Watts, Michael; and Clark, James, 6,016,323, Cl. 372-20.000.

Newform S.p.A.: *See*—
Scaramucci, Mauro, 6,015,367, Cl. 482-5.000.

Newman, Harold Leonard: *See*—
Rishton, Michael Lyne; Newman, Harold Leonard; and Goldenberg, Alec, 6,015,391, Cl. 600-567.000.

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Nunnally, M. A.; and Secrist, Paul F., 6,016,230, Cl. 359-819.000.

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Cannell, David W.; Mathur, Hitren; Nguyen, Nghi; and Espino, Cynthia, 6,015,574, Cl. 424-450.000.

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Barinaga, John A.; Clark, James E.; Merrill, David O.; Nguyen, Ngoc-Diep; and Otis, David R., Jr., 6,015,209, Cl. 347-86.000.

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Ogawa, Yoshitaka, 6,015,237, Cl. 384-475.000.

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Nakamura, Masao; and Takagishi, Yukio, 6,015,850, Cl. 524-188.000.

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Fukumura, Tomohiro, 6,015,192, Cl. 303-140.000.
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Yasuda, Akihiro; and Niwa, Kazuharu, 6,015,511, Cl. 264-1.700.

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Urata, Kazuya; Yoshimi, Naoto; Kubota, Takahiro; Yamashita, Masaaki; and Haruta, Yasuhiko, 6,015,628, Cl. 428-623.000.

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Yagi, Masanori; Noda, Atsuhito; Ichijo, Yasuhiro; and Hirata, Hideyuki, 6,015,304, Cl. 439-108.000.

Noe, Stephen Allen: *See*—
Joshi, Girish Chimanlal; and Noe, Stephen Allen, 6,015,450, Cl. 95-139.000.

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Suzuki, Minoru; and Nojiri, Toshihiko, 6,015,275, Cl. 417-423.120.

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Pykälistö , Mika, 6,016,337, Cl. 379-92.020.

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Swensen, Jeffrey E.; Nolan, Terence J.; Spence, J. Loyd; and Rhyne, Edward P., 6,015,152, Cl. 277-321.000.

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Yosida, Takasi; Kane, Joji; and Nomura, Noboru, 6,016,109, Cl. 340-941.000.

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Kawaguchi, Takayuki; Nomura, Sumihiro; and Tsujihara, Kenji, 6,015,901, Cl. 546-89.000.

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Koenraadt, Martinus Adrianus Anthonius Maria; Noomen, Arie; Van Den Berg, Keimpe Jan; Van Oorschot, Josephus Christiaan; and Klinkenberg, Huig, 6,015,864, Cl. 525-385.000.

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Ekwall, Christer; and Norén, Kjell, 6,016,443, Cl. 600-519.000.

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Mukai, Yoshinobu; and Noro, Yoshiki, 6,015,023, Cl. 180-446.000.

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Bannister, Cecil H., 6,016,425, Cl. 455-422.000.
Blouin, Francois; and Comeau, Guillaume, 6,016,140, Cl. 345-178.000.
Jain, Praveen K.; and Soin, Harpreet, 6,016,258, Cl. 363-17.000.
Lo, Wing; and Chang, Jue, 6,016,124, Cl. 342-373.000.
Williamson, John M.; Guterman, Alexandre J.; Zani, Robert; Newell, Terry; and Brown, Anthony K. Dale, 6,016,086, Cl. 333-109.000.

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MacDonald, Lorne; and Pockrandt, Don, 6,014,880, Cl. 72-181.000.

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Swartzel, Kenneth R.; and Simunovic, Josip, 6,015,231, Cl. 374-102.000.

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Hinds, Walter E., 6,016,021, Cl. 310-12.000.

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Barton, Paul; Searle, Jeffrey Graham; Chrystie, Peter John; and Edwards, Keith Russell, 6,016,123, Cl. 342-373.000.
Bayraktar, Arsavir, 6,016,340, Cl. 379-114.000.
Khafizov, Farid; Jain, Nikhil; and Anandampillai, Damodar, 6,016,429, Cl. 455-446.000.
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Leib, Kenneth G., 6,016,232, Cl. 359-886.000.
Meyer, Ronald K., Jr.; Vaidyanathan, Mohan; Pekny, William; Griffith, Gerald P.; and Mui, Peter H., 6,016,214, Cl. 359-237.000.
Sanger, Philip Albert; Lindberg, Frank A.; and Garcen, Walter, 6,016,007, Cl. 257-714.000.
Stappaerts, Eddy Alfons, 6,016,210, Cl. 359-10.000.

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Brown, Patrick M.; Northrup, Michael C.; and Bakke, Bart F., 6,015,535, Cl. 423-179.000.

Norton Company: *See*—
Hong, Keith C.; Dwyer, Patrick E.; Keil, Elinor B.; Lambert, Edward; and Aspi, Fershid, 6,015,338, Cl. 451-541.000.

Norton, James C.: *See*—
Shay, Jerry W.; Wright, Woodring E.; Piatyszek, Mieczyslaw A.; Corey, David R.; and Norton, James C., 6,015,710, Cl. 435-375.000.

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Adomeit, Mark E.; Fellows, Kevin J.; Cannon, Philip P.; Spykerman, David J.; and Nothwehr, Rollin E., 6,015,071, Cl. 224-42.340.
Notten, Petrus H.L.; Bergveld, Hendrik J.; and Kruijt, Wanda S., to U.S. Philips Corporation. Battery management system and battery simulator. 6,016,047, Cl. 320-137.000.
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Novell, Inc.: *See*—
Ferguson, Daniel T., 6,016,499, Cl. 707-104.000.
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Jeppesen, Lone; and Sauerberg, Per, 6,015,813, Cl. 514-256.000.
von der Osten, Claus; Cherry, Joel R.; Bjornvad, Mads E.; Vind, Jesper; and Rasmussen, Michael Dolberg, 6,015,783, Cl. 510-392.000.
Now Technologies, Inc.: *See*—
Osgar, Michael L.; and Rouzegar, Mirsaeed, 6,015,068, Cl. 222-400.700.
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Luft, H. Bernie; Wilde, Graham; and Pelensky, Peter J., 6,015,015, Cl. 166-384.000.
Noyola, Richard A.: *See*—
Anzel, Bernard M.; Ho, Yiu-Hung M.; and Noyola, Richard A., 6,015,116, Cl. 244-169.000.
Nozawa, Akira: *See*—
Kawazu, Yukio; Suzuki, Toshimitsu; Yuasa, Masayuki; Yokomizo, Yuichi; Majima, Toshiro; Ito, Takao; Nakashima, Takuji; and Nozawa, Akira, 6,015,925, Cl. 564-316.000.
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Suzuki, Minoru; and Nojiri, Toshihiko, 6,015,275, Cl. 417-423.120.
Numagami, Atsushi: *See*—
Yokoyama, Katsunori; Watanabe, Kazushi; and Numagami, Atsushi, 6,016,413, Cl. 399-113.000.
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Nunome, Hiromi, to JEOL Ltd. Energy Filter. 6,015,973, Cl. 250-305.000.
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Nykolak, Gerald: *See*—
Adams, Laura Ellen; Chen, Young-Kai; and Nykolak, Gerald, 6,016,374, Cl. 385-24.000.
O, Jung Sok, to Hyundai Motor Company. Method of manufacturing a double-structure synchronizer ring. 6,014,807, Cl. 29-893.370.
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Jargon, Jonathan David; Wenker, Paul Andrew; Fernalld, Kenneth Hudson; Bodmer, James Harold; and Paquet, David William, 6,016,240, Cl. 360-105.000.
Obeng, Yaw Samuel, to Lucent Technologies Inc. Method of forming planarized layers in an integrated circuit. 6,015,333, Cl. 451-8.000.
Obermeyer, Richard: *See*—
Welch, Randall Scott; and Obermeyer, Richard, 6,015,196, Cl. 312-223.200.
Obrecht, Werner: *See*—
Langstein, Gerhard; Bohnenpoll, Martin; Denninger, Uwe; Obrecht, Werner; and Plesch, Peter, 6,015,841, Cl. 522-29.000.
O' Brien, Michael J.: *See*—
McDermott, Philip J.; O'Brien, Michael J.; and Jeram, Edward M., 6,015,853, Cl. 524-303.000.
Ochiai, Toshihiko: *See*—
Kabeya, Nobuaki; Takeuchi, Akihiko; Ochiai, Toshihiko; Katoh, Motoi; Miyashiro, Toshiaki; Suzuki, Takehiko; and Kume, Takao, 6,016,418, Cl. 399-314.000.
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Boudet, Alain; Pettenati, Jacqueline; Goffner, Deborah; Halpin, Claire; O'Connell, Ann; Romestant, Michel; Boerjan, Wout; and Leple, Jean-Charles, 6,015,943, Cl. 800-298.000.
O' Connor, John B.: *See*—
Lapikas, James S.; and O'Connor, John B., 6,015,519, Cl. 264-74.000.
Oda, Hiromi; Okajima, Shinpei; and Sugimoto, Masanori, to Shimano, Inc. Protective cap-system for bicycle cable. 6,014,910, Cl. 74-502.600.
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Langford, Gordon B.; Montano, Cesar A.; Odom, Doug; Danielson, Thomas; Allen, Richard; Putnam, Greg; and Beck, David, 6,015,163, Cl. 280-735.000.
Oelschlaegel, Victor R.: *See*—
Popoff, Peter; Hodgkins, David H.; Clausen, Michael D.; and Oelschlaegel, Victor R., 6,015,492, Cl. 210-238.000.
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Ogawa, Nobuhiro; and Tsukuda, Masanori, to Fujitsu Limited. Housing unit. 6,016,249, Cl. 361-685.000.
Ogawa, Yoshitaka, to Nippon Thompson Co., Ltd. Track roller bearing with stud. 6,015,237, Cl. 384-475.000.
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Rixner, Scott W.; and Ogilvie, Clarence R., 6,016,531, Cl. 711-118.000.
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Endo, Yukio; Nakamura, Nobuhiro; and Ogo, Ikuo, 6,016,174, Cl. 349-43.000.
Oguchi, Wataru: *See*—
Nakamura, Hidehiro; Satou, Kazuki; and Oguchi, Wataru, 6,015,309, Cl. 439-159.000.
Ogura, Makoto, to Canon Kabushiki Kaisha. Light conductive member, illuminating device having the same, and information processing apparatus having the illuminating device. 6,015,200, Cl. 347-3.000.
Ohara, Kohki: *See*—
Hirota, Koichi; Ohara, Kohki; and Mori, Kazuyoshi, 6,015,449, Cl. 75-599.000.
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Schneck, Jonathan; and O'Herrin, Sean, 6,015,884, Cl. 530-387.300.
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Ohlson, Per; and Jacobsson, Kurt Arne Gunnar, to Memminger-IRO GmbH. Thread feed device. 6,015,109, Cl. 242-364.700.
Ohlsson, Håkan: *See*—
Haugen, Ketil; Ohlsson, Håkan; and Persson, Per-Oskar, 6,015,453, Cl. 96-195.000.
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Ohno, Manabu: *See*—
Ugai, Toshiyuki; and Ohno, Manabu, 6,015,647, Cl. 430-110.000.
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Kimura, Atsunori; Ono, Yoichi; Minamishin, Hayato; Tanaka, Yuji; Ohno, Seiichi; Hata, Hidekazu; Ueda, Hiroyuki; Esaki, Isamu; and Uchida, Atsushi, 6,015,147, Cl. 271-163.000.
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Miura, Mareki; and Ohnuma, Yoshinobu, 6,015,873, Cl. 528-157.000.
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Amano, Yasunobu; Ichida, Koji; Endo, Naruhiko; Ohshige, Yoichi; and Mizuki, Masahiko, 6,016,030, Cl. 313-414.000.
Ohta, Takashi: *See*—
Matsushita, Mitsumasa; Taniguchi, Takumi; Ohta, Takashi; Sato, Norio; Hoshino, Yuji; Kondo, Kanemitsu; Abe, Naruaki; and Suzuki, Toshiyuki, 6,015,856, Cl. 524-451.000.
Ohta, Yoshiteru, to Sumitomo Chemical Company, Limited. Polyazo compound and method for dyeing or textileprinting fiber material using the same. 6,015,885, Cl. 534-637.000.
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Miura, Kazunori; Takagi, Masanori; Kifuku, Takayuki; and Ohtagaki, Shigeki, 6,016,042, Cl. 318-430.000.
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Hirotsu, Takashi; Ohtani, Kazuyoshi; and Nagaoka, Teruji, 6,014,873, Cl. 65-104.000.
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Ohtsuki, Michihito, to NEC Corporation. Paging system. 6,016,106, Cl. 340-825.440.
Öhy, Günter: *See*—
Netzer, Emanuel; and Öhy, Günter, 6,015,199, Cl. 312-334.800.
Ohya, Masakiyo, to Fuji Kiko Co., Ltd. Adjustable hinge mount for reclinable seat. 6,014,806, Cl. 29-893.330.
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Maruo, Katsuhiko; Shimizu, Keisuke; and Oka, Masami, 6,016,435, Cl. 600-316.000.
Okabayashi, Takahiro; Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Terayama, Yoshimi; Sakaki, Takashi; Ikegami, Yuichi; Kondo, Kazuo; Tamura, Yoichi; and Nakatsuka, Yasuo, to Canon Kabushiki Kaisha; and Sumitomo Metal Industries, Ltd. Electrical connections using deforming compression. 6,015,081, Cl. 228-180.220.
Okabe, Jun: *See*—

Kuzumaki, Yoshihiro; Moriyama, Iwao; and Okabe, Jun, 6,015,860, Cl. 525-123.000.

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Okada, Masahiko; Ban, Takashi; Hirose, Tatsuya; Yagi, Kiyoshi; Hoshino, Tatsuyuki; Mori, Hidefumi; Okabe, Takanori; and Hoshino, Nobuaki, 6,015,349, Cl. 464-31.000.

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Okumura, Takashi; Okada, Hiroshi; and Itoh, Yoshifumi, 6,015,108, Cl. 241-101.730.

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Morizono, Kenichi; Okada, Keiji; Shigemoto, Hiromi; and Kawachi, Hideshi, 6,015,625, Cl. 428-500.000.

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Oki Data Corporation: *See*—
Kitamura, Makoto, 6,016,416, Cl. 399-167.000.

Oki Electric Industry Co., Ltd.: *See*—
Uehara, Hidenori, 6,016,070, Cl. 327-176.000.

Oki Telecom, Inc.: *See*—
Barber, Clifton J.; and Hardin, Stephen T., 6,016,427, Cl. 455-434.000.

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Oku, Teruo; Kayakiri, Hiroshi; Abe, Yoshito; Sawada, Yuki; and Mizutani, Tsuyoshi, to Fujisawa Pharmaceutical Co., Ltd. Quinoline derivatives as bradykinin agonists. 6,015,818, Cl. 514-312.000.

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Wada, Masashi; Okuba, Takao; and Furuno, Takeshi, 6,016,560, Cl. 714-718.000.

Okumura, Katsuya: *See*—
Hieda, Katsuhiko; Arikado, Tsunetoshi; and Okumura, Katsuya, 6,015,990, Cl. 257-310.000.

Okumura, Masafumi: *See*—
Yamauchi, Yasuji; Yamanaka, Toshio; Okumura, Masafumi; Hirai, Masashi; Taka, Kyousuke; Uno, Kinji; Yoneda, Yoshiharu; and Yamauchi, Hirokazu, 6,014,920, Cl. 83-560.000.

Okumura, Takashi; Okada, Hiroshi; and Itoh, Yoshifumi, to Nippon Pneumatic Manufacturing Co., Ltd. Crusher. 6,015,108, Cl. 241-101.730.

Okumura, Yasumasa: *See*—
Ikushima, Satoshi; Wada, Seiji; Okumura, Yasumasa; Aida, Haruhiko; Yabuta, Motoshi; Yukawa, Yoshiyuki; and Hasada, Ken-ichi, 6,015,848, Cl. 523-427.000.

Okuno, Tatsuo: *See*—
Katsuno, Ryuji; Kobayashi, Masanori; Okuno, Tatsuo; Ando, Chikara; Arai, Kazuhiko; Kitano, Yoshihisa; Katsuta, Nobuhiro; and Sakaguchi, Yasuo, 6,016,417, Cl. 399-308.000.

Okusawa, Tsutomu; Koyama, Kazuhito; Yamagishi, Masahiko; Hatamiya, Shigeo; Ajiro, Taiko; Sunou, Megumi; and Ishigaki, Yukio, to Hitachi, Ltd. Waste processing system and fuel reformer used in the waste processing system. 6,014,863, Cl. 60-653.000.

Olbrich, Armin: *See*—
Görge, Astrid; Meese-Marktscheffel, Juliane; Naumann, Dirk; Olbrich, Armin; and Schrumpf, Frank, 6,015,447, Cl. 75-255.000.

Oleksiewicz, Radek A., to Navistar International Transportation Corp. Exhaust gas recirculation control apparatus. 6,014,960, Cl. 123-568.200.

Oligos Etc., Inc.: *See*—
Dale, Roderic M. K.; Arrow, Amy; Srivastava, Suresh C.; and Raza, Syed K., 6,015,886, Cl. 536-23.100.

Olin, Peter M.; and Maloney, Peter James, to General Motors Corporation. Internal combustion engine control with model-based barometric pressure estimator. 6,016,460, Cl. 701-102.000.

Olivier, André W.; Ragan, Bryant G.; and Cronvich, James T., to Input/Output, Inc. Depth control device for an underwater cable. 6,016,286, Cl. 367-17.000.

Olson, Eric N.; Li, Li; and Miano, Joseph M., to University of Texas System, The Board of Regents of the. Smooth muscle 22α promoter, gene transfer vectors containing the same, and method of use of the same to target gene expression in arterial smooth muscle cells. 6,015,711, Cl. 435-375.000.

Olszewski, Edward C.: *See*—
Lozon, Robert J.; and Olszewski, Edward C., 6,015,961, Cl. 219-69.150.

Olympus Optical Co., Ltd.: *See*—
Namiki, Mitsuru, 6,016,224, Cl. 359-619.000.
Uzawa, Tsutomu, 6,016,228, Cl. 359-687.000.

Omori, Makoto: *See*—
Ohtomo, Fumio; Kimura, Kazuaki; Brabec, Vernon J.; Hirano, Satoshi; and Omori, Makoto, 6,016,455, Cl. 701-50.000.

Omori, Shigeru; and Kieffer, Jean Marie, to Acheson Industries, Inc. Cold dry plating process for forming a polycrystalline structure film of zinc-iron by mechanical projection of a composite material. 6,015,586, Cl. 427-11.000.

Onishi, Katsuhiro; Yamauchi, Kiminori; Tsukada, Hideaki; Ueda, Yukinori; and Masuda, Fumitoshi, to Murata Manufacturing Co., Ltd. Variable resistor. 6,016,098, Cl. 338-160.000.

Ono, Chihiro, to Fujitsu Limited. Data processing apparatus with program allocating section for selectively allocating programs in first and second memory. 6,016,547, Cl. 713-300.000.

Ono, Hiroo: *See*—
Arami, Junichi; Ono, Hiroo; Kondo, Tomomi; and Miyata, Koji, 6,014,943, Cl. 118-723.00E.

Ono, Yoichi: *See*—
Kimura, Atsunori; Ono, Yoichi; Minamishin, Hayato; Tanaka, Yuji; Ohno, Seiichi; Hata, Hidekazu; Ueda, Hiroyuki; Esaki, Isamu; and Uchida, Atsushi, 6,015,147, Cl. 271-163.000.

Onomura, Masaaki: *See*—
Sugiura, Lisa; Ishikawa, Masayuki; Nunoue, Shinya; Onomura, Masaaki; and Yamamoto, Masahiro, 6,015,979, Cl. 257-86.000.

OnStream, Inc.: *See*—
Vollmann, Norbert C., 6,016,236, Cl. 360-96.500.

Oppenheim, Daniel P.; Abrams, Steven R.; Pazel, Donald P.; and Wright, James L., to International Business Machines Corporation. System and method for applying a harmonic change to a representation of musical pitches while maintaining conformity to a harmonic rule-base. 6,015,949, Cl. 84-613.000.

Optima Inc.: *See*—
Yang, Zhou; and Lin, Yin-Nian, 6,015,512, Cl. 264-2.200.

Optimark Technologies, Inc.: *See*—
Rickard, John T.; and Lupien, William A., 6,016,483, Cl. 705-37.000.

Orange, Paul Richard: *See*—
Heath, Paul Roy; Orange, Paul Richard; Pearson, Ronald Carl Alan; and Wright, Simon Ralph, 6,015,888, Cl. 536-23.500.

Orima, Hajime, to Firster Co., Ltd. Composite yarn comprised of chain stitch yarn and inlay yarn. 6,015,618, Cl. 428-373.000.

Orloff, Glennis J., to Warner & Lambert Company. Transcutaneous electric nerve stimulator razor system. 6,014,918, Cl. 83-13.000.

Ormat Industries Ltd.: *See*—
Bronicki, Lucien Y.; Sinai, Joseph; Doron, Benjamin; and Kaplan, Uri, 6,014,856, Cl. 60-39.120.

Ormco Corporation: *See*—
Andreiko, Craig A.; and Payne, Mark A., 6,015,289, Cl. 433-3.000.

Orne, Donald A.: *See*—
Flannery, Philip A.; McClafferty, Jason; and Orne, Donald A., 6,015,963, Cl. 219-121.520.

Orthofix S.r.l.: *See*—
Faccioli, Giovanni; Venturini, Daniele; and Pennig, Dietmar, 6,015,413, Cl. 606-104.000.

Osgar, Michael L.; and Rouzegar, Mirsaeed, to Now Technologies, Inc. Liquid chemical dispensing system with a key code ring for connecting the proper chemical to the proper attachment. 6,015,068, Cl. 222-400.700.

O' Shaughnessy, Timothy G. Tunable oscillator using a reference input frequency. 6,016,081, Cl. 331-48.000.

Oshida, Yoshitada: *See*—
Noguchi, Minori; Kenbo, Yukio; Oshida, Yoshitada; Shiba, Masataka; Yoshitaka, Yasuhiro; and Murayama, Makoto, 6,016,187, Cl. 355-53.000.

Oshima, Takao: *See*—
Kogure, Eiji; Fukushima, Tadashi; Tsukahara, Hiroaki; Imai, Toshihisa; Oshima, Takao; and Kaga, Kunihiko, 6,015,008, Cl. 165-185.000.

Osram Sylvania Inc.: *See*—
Lapatovich, Walter P.; Doell, Gerhard W.; and Smith, Robert K., 6,016,031, Cl. 313-493.000.

Osset Hernandez, Miguel: *See*—
Llosas Bigorra, Joaquin; Bonastre Gilabert, Nuria; Osset Hernandez, Miguel; Closa Cruxens, Xavier; and Pi Subirana, Rafael, 6,015,780, Cl. 510-237.000.

Ostrow, David H.: *See*—
Hackett, John R., Jr.; Hoff, Jane A.; Ostrow, David H.; and Golden, Alan M., 6,015,662, Cl. 435-5.000.

Ota, Masaki; Hamasaki, Masaru; Hori, Masayoshi; Kobayashi, Hisakazu; Koumura, Satoshi; and Makino, Yasunori, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable displacement compressor. 6,015,269, Cl. 417-222.200.

Ota, Yuichi, to Ricoh Company, Ltd. Liquid crystal display device having a transparent input touch panel. 6,016,134, Cl. 345-104.000.

Otis, David R., Jr.: *See*—
Barinaga, John A.; Clark, James E.; Merrill, David O.; Nguyen, Ngoc-Diep; and Otis, David R., Jr., 6,015,209, Cl. 347-86.000.

Otis Elevator Company: *See*—
Stöxen, Oliver; and Mehlert, Martin, 6,015,038, Cl. 198-322.000.

Otka, Robert P.: *See*—
Kolb, Richard P.; and Otka, Robert P., 6,015,365, Cl. 477-103.000.

OTOR: *See*—
Mathieu, Gérard; and Desertot, Didier, 6,015,084, Cl. 229-122.320.

Otsuka, Naoji: *See*—
Kanematsu, Daigoro; Takenouchi, Masanori; Otsuka, Naoji; Ujita, Toshihiko; Yano, Kentaro; and Iwasaki, Osamu, 6,015,210, Cl. 347-87.000.

Otsuki, Nobuaki: *See*—
Awaji, Toshio; Otsuki, Nobuaki; Arakawa, Motohiro; and Tanaka, Hiromichi, 6,015,651, Cl. 430-315.000.

Otsuki, Tatsuo: *See*—
Arita, Koji; Fujii, Eiji; Shimada, Yasuhiro; Uemoto, Yasuhiro; Nasu, Toru; Matsuda, Akihiro; Nagano, Yoshihisa; Inoue, Atsuo; Matsuura, Taketoshi; and Otsuki, Tatsuo, 6,015,987, Cl. 257-303.000.

Ouchi, Teruo, to Asahi Kogaku Kogyo Kaisha. Endoscopic treatment tool. 6,015,381, Cl. 600-104.000.

Outboard Marine Corporation: *See*—
Kolb, Richard P.; and Otka, Robert P., 6,015,365, Cl. 477-103.000.

Ou-Yang, David T., to 3M Innovative Properties Company. Imaging medium comprising polyvinyl chloride, method of imaging said medium, and image-bearing medium. 6,015,603, Cl. 428-195.000.

Ovens, Kevin M.: *See*—
Smith, Patrick R.; and Ovens, Kevin M., 6,016,332, Cl. 375-376.000.

Overby, Jerry, to Timbren Industries Inc. Heavy duty truck suspension. 6,015,158, Cl. 280-124.163.

Overby, Linwood Hugh, Jr.; and Rajaraman, Balachandar, to International Business Machines Corporation. Methods, systems and computer program products for preemptive avoidance of constraints for shared resources. 6,016,503, Cl. 709-104.000.

Overholt, Trenton M.; Apps, William Patrick; and Koefelda, Gerald R., to Rehrig Pacific Company. Collapsible container. 6,015,056, Cl. 220-6.000.

Owen, Donald R., to Life Science Holdings, Inc. Cryogenic fluid heat exchanger method and apparatus. 6,014,864, Cl. 62-51.100.

Owen, Harold D.: *See*—
Umphries, Donald V.; Owen, Harold D.; Ford, Bobby R.; and Wesson, David S., 6,014,933, Cl. 102-312.000.

Owen Oil Tools, Inc.: *See*—
Umphries, Donald V.; Owen, Harold D.; Ford, Bobby R.; and Wesson, David S., 6,014,933, Cl. 102-312.000.

Owens Corning Fiberglas Technology, Inc.: *See*—
McGrath, Ralph D.; and Alter, Harry A., 6,015,025, Cl. 181-199.000.
McGrath, Ralph D., 6,015,026, Cl. 181-295.000.
Phillips, John D., 6,014,847, Cl. 52-311.100.

Owens, Lewis V.: *See*—
Cance, William G.; Liu, Edison T.; and Owens, Lewis V., 6,015,893, Cl. 536-24.500.

Ozawa, Sigeyuki; and Nakase, Ryoichi, to Yamaha Hatsudoki Kabushiki Kaisha. Fuel pump mounting arrangement for personal watercraft. 6,015,321, Cl. 440-88.000.

Pacer, James M.: *See*—
Budnik, Roger W.; Pacer, James M.; Raj, Guru B.; Shoemaker, Ralph A.; Swales, Michael G.; and Beard, Michael E., 6,016,204, Cl. 358-1.140.

Pacesetter AB: *See*—
Ekwall, Christer; and Norén, Kjell, 6,016,443, Cl. 600-519.000.

Pacific Micro Data, Inc.: *See*—
Welch, Randall Scott; and Obermeyer, Richard, 6,015,196, Cl. 312-223.200.

Pacific Scientific Instruments Company: *See*—
Girvin, Kenneth L.; and DeFreez, Richard K., 6,016,194, Cl. 356-337.000.

Paden, Bradley: *See*—
Antaki, James F.; Paden, Bradley; Burgreen, Gregory; and Groom, Nelson, 6,015,272, Cl. 417-356.000.

Padture, Nitin P.; Gell, Maurice; and Klemens, Paul G., to University of Connecticut, The. Ceramic materials for thermal barrier coatings. 6,015,630, Cl. 428-632.000.

Page, Vince, to Stewart & Stevenson Services, Inc. Light hydrocarbon fuel cooling system for gas turbine. 6,014,855, Cl. 60-39.060.

Pagedas, Anthony C., to Pagedas, Anthony C. Integrally formed suture and suture lock. 6,015,428, Cl. 606-232.000.

Paiva, Joseph V. R.: *See*—
Chang, Shun-Hwa; Paiva, Joseph V. R.; and Withington, Alan Henry, 6,016,142, Cl. 345-334.000.

Palermo, Thomas J.: *See*—
Zwart, Hans J.; Tyler, Lawrence R.; Palermo, Thomas J.; Bladel, Kevin Van; Young, Roderick A.; and Jervis, James E., 6,015,382, Cl. 600-207.000.

Palomar Medical Technologies, Inc.: *See*—
Altshuler, Gregory; and Erofeev, Andrei V., 6,015,404, Cl. 606-9.000.

Pan, Pai-Hung: *See*—
Hu, Yongjun; Pan, Pai-Hung; Ping, Er-Xuan; Thakur, Randhir P.S.; and DeBoer, Scott, 6,015,997, Cl. 257-412.000.

Panda Project, The: *See*—
Crane, Stanford W., Jr.; Krishnapura, Lakshminarasimha; Li, Yun; Behar, Moises; Fuoco, Dan; and Ahearn, Bill, 6,016,256, Cl. 361-813.000.

Pandora International, Ltd.: *See*—
Brett, Stephen, 6,016,167, Cl. 348-646.000.

Pandozy, Raffaele Martini. Combined therapeutic exercise apparatus for the back. 6,015,370, Cl. 482-97.000.

Panella, Augusto P.: *See*—
Walse, Alan S.; Lang, Harold Keith; Panella, Augusto P.; Triner, Irvin R.; and Tung, Shyh-Lin, 6,015,299, Cl. 439-60.000.

Pang, Nelson: *See*—
Broadhead, Douglas; Eakins, Richard; Cimachowski, Czeslaw; Bentley, Brian; Krommenhoek, Joe; Ma, Son; Harding, David; and Pang, Nelson, 6,015,189, Cl. 297-353.000.

Papallo, Thomas F., Jr.; Seymour, Raymond K.; and Tiwari, Anupam, to General Electric Company. High ampacity pinless conducting joint in movable contact arm assembly. 6,015,957, Cl. 200-244.000.

Paquet, David William: *See*—
Jargon, Jonathan David; Wenker, Paul Andrew; Fernalld, Kenneth Hudson; Bodmer, James Harold; and Paquet, David William, 6,016,240, Cl. 360-105.000.

Paquet, Eric: *See*—
Rioux, Marc; and Paquet, Eric, 6,016,487, Cl. 707-2.000.

Parallel Design, Inc.: *See*—
Finsterwald, P. Michael; Douglas, Stephen Joseph; and Just, Ricky Gail, 6,014,898, Cl. 73-642.000.

Parekh, Kunal R., to Micron Technology, Inc. Bitline contact structures and DRAM array structures. 6,015,983, Cl. 257-296.000.

Park, Jong Wook, to Samsung Display Devices Co., Ltd. Luminescent compound for an electroluminescence display device. 6,015,631, Cl. 428-690.000.

Park, Sung-hee; Kim, Yeon-bae; and Shin, Jae-seob, to Samsung Electronics Co., Ltd. Digital data coding/decoding method and apparatus. 6,016,111, Cl. 341-55.000.

Parker, Allan: *See*—
Skrovan, Joseph C.; and Parker, Allan, 6,016,554, Cl. 714-25.000.

Parker-Hannifin Corporation: *See*—
Hayden, Daniel B., 6,015,499, Cl. 210-767.000.

Parker Hannifin Customer Support Inc.: *See*—
Popoff, Peter; Hodgkins, David H.; Clausen, Michael D.; and Oelschlaegel, Victor R., 6,015,492, Cl. 210-238.000.

Parker, James A.; and Ehrhart, Michael A., to Welch Allyn, Inc. Decoding of real time video imaging. 6,015,088, Cl. 235-462.010.

Parker, Michael Andrew: *See*—
Coffey, Kevin Robert; Howard, James Kent; Hylton, Todd Lanier; and Parker, Michael Andrew, 6,016,241, Cl. 360-113.000.

Parks, Gerald R., to Gregory, John R. Paintball gun loader. 6,015,058, Cl. 220-229.000.

Parks, Terry: *See*—
Henry, G. Glenn; and Parks, Terry, 6,016,544, Cl. 712-234.000.

Parmar, Bipinkumar G.: *See*—
Williams, Humphrey; Hughes, Kevin; and Parmar, Bipinkumar G., 6,016,484, Cl. 705-39.000.

Partlo, William N.: *See*—
Ness, Richard M.; Partlo, William N.; and Sandstrom, Richard L., 6,016,325, Cl. 372-38.000.

Pasotti, Marco: *See*—
Gerna, Danilo; Canegallo, Roberto; Chioffi, Ernestina; Pasotti, Marco; and Rolandi, Pier Luigi, 6,016,272, Cl. 365-185.210.

Pastel, Paul W.: *See*—
Adkisson, James W.; Lasky, Jerome B.; Pastel, Paul W.; and Rankin, Jed H., 6,015,745, Cl. 438-405.000.

Patel, Neilesh R.: *See*—
Rodriguez, Arturo A.; Patel, Neilesh R.; and Simerly, Timothy W., 6,016,163, Cl. 348-420.000.

Patil, Bhaskar Ganpatrao: *See*—
Patil, Shamrao Ganpatrao; Patil, Bhaskar Ganpatrao; Gokhale, Digambar Vitthal; Bastawde, Kulbhushan Balwant; Puntambekar, Ulka Shrirang; and Ranjekar, Prabhakar Kamalakar, 6,015,699, Cl. 435-161.000.

Patil, Shamrao Ganpatrao; Patil, Bhaskar Ganpatrao; Gokhale, Digambar Vitthal; Bastawde, Kulbhushan Balwant; Puntambekar, Ulka Shrirang; and Ranjekar, Prabhakar Kamalakar, to Council of Scientific & Industrial Research. Process for the production of alcohol. 6,015,699, Cl. 435-161.000.

Patitsas, George Philemon; and Sandstrom, Paul Harry, to Goodyear Tire & Rubber Company, The. Tire cure bladder composition with alkylphenoxy-poly (alkyleneoxy) alkanol. 6,015,525, Cl. 264-315.000.

Patti, Andrew: *See*—
Lin, Qian; Tretter, Daniel R.; Konstantinides, Konstantinos; and Patti, Andrew, 6,016,354, Cl. 382-117.000.

Patton, Jasson T.: *See*—
Nickias, Peter N.; McAdon, Mark H.; Patton, Jasson T.; Friedrichsen, Bernard P.; Soto, Jorge; Stevens, James C.; and VanderLende, Daniel D., 6,015,868, Cl. 526-127.000.

Pawlak, John Lawrence: *See*—
Krishnamurthy, Sundram; Crawley, Michael William; Bailey, David Scott; and Pawlak, John Lawrence, 6,015,657, Cl. 430-554.000.

Payne, Lendon G.: *See*—
Andrianov, Alexander K.; Payne, Lendon G.; Sargent, Jonathan R.; and Sule, Sameer S., 6,015,563, Cl. 424-184.100.

Payne, Mark A.: *See*—
Andreiko, Craig A.; and Payne, Mark A., 6,015,289, Cl. 433-3.000.

Pazel, Donald P.: *See*—
Oppenheim, Daniel P.; Abrams, Steven R.; Pazel, Donald P.; and Wright, James L., 6,015,949, Cl. 84-613.000.

Pearse, James N.: *See*—
Gershen, Bernard; Rosenbaum, Saul; and Pearse, James N., 6,016,244, Cl. 361-50.000.

Pearson, Ronald Carl Alan: *See*—
Heath, Paul Roy; Orange, Paul Richard; Pearson, Ronald Carl Alan; and Wright, Simon Ralph, 6,015,888, Cl. 536-23.500.

Pechacek, James T.; DeVries, Donald H.; Tisdell, Francis E.; Suhr, Robert G.; Johnson, Peter L.; Hatton, Christopher J.; Yap, Maurice Chee Hoong; Stockdale, Gary D.; Hamilton, Christopher T.; and Johnson, George W. 3-(substituted phenyl)-5-(thienyl or furyl)-1, 2, 4-triazole compounds. 6,015,826, Cl. 514-383.000.

Peck, Philip D. Self-tapping screw with improved cutting point. 6,015,252, Cl. 411-387.100.

Peck, Wallace A.: *See*—

Mastain, Steven A.; Peck, Wallace A.; Simplair, Diana M.; and Rothstein, Kurt A., 6,016,242, Cl. 360-119.000.

Peckholdt, Keith: *See—*
Molinari, Lou; Gooderum, Steve; Peckholdt, Keith; DiMarco, Frank; Jackson, Michael; DePoalo, Ron; Makhijani, Sunil; Chung, Jennifer; Chou, Winnie; and Gould, Mary Beth, 6,016,482, Cl. 705-35.000.

Pedemonte, Ron; and Stroben, Andreas, to Dystar Textilefarben GmbH & Co. Deep black dye mixtures of fiber-reactive azo dyes and a process for dyeing hydroxy and/or carboxamido containing fibers. 6,015,439, Cl. 8-549.000.

Peel, Richard M.: *See—*
Coombs, Christopher E.; Richter, Robert J.; Peel, Richard M.; and Fordham, Andrew J., 6,016,160, Cl. 348-61.000.

Peeters, Jozef: *See—*
Bamelis, Jean-Marie; Delanote, Chris; and Peeters, Jozef, 6,014,990, Cl. 139-194.000.

Pegasus Airwave Limited: *See—*
Hannagan, Angus Patrick Douglas; and McGrath, Michael Alan, 6,015,273, Cl. 417-417.000.

Peiffer, Dennis George: *See—*
Rabeony, Manese; Peiffer, Dennis George; Costello, Christine Ann; Colle, Karla Schall; Wright, Pamela J; and Talley, Larry Dalton, 6,015,929, Cl. 585-15.000.

Pekny, William: *See—*
Meyer, Ronald K., Jr.; Vaidyanathan, Mohan; Pekny, William; Griffith, Gerald P.; and Mui, Peter H., 6,016,214, Cl. 359-237.000.

Pelensky, Peter J.: *See—*
Luft, H. Bernie; Wilde, Graham; and Pelensky, Peter J., 6,015,015, Cl. 166-384.000.

Pelletier, Robert: *See—*
Carruth, Cary; Mondro, Frederick A.; Peralta, John J.; Pelletier, Robert; and Kovacs, Nickolas, 6,015,175, Cl. 294-65.500.

Pelmorex Media Inc.: *See—*
Mackinnon, Russell D. N., 6,016,158, Cl. 348-7.000.

Pem Abrasifs Refractaires: *See—*
Alary, Jean André, 6,015,442, Cl. 51-309.000.

Penn State Research Foundation, The: *See—*
Chung, Tze-Chiang; and Lu, Honglan, 6,015,862, Cl. 525-320.000.

Pennig, Dietmar: *See—*
Faccioli, Giovanni; Venturini, Daniele; and Pennig, Dietmar, 6,015,413, Cl. 606-104.000.

Pennington, Daryl. Bridging hipbelt for a backpack. 6,015,076, Cl. 224-637.000.

Peralta, John J.: *See—*
Carruth, Cary; Mondro, Frederick A.; Peralta, John J.; Pelletier, Robert; and Kovacs, Nickolas, 6,015,175, Cl. 294-65.500.

Perego, Bruno; and Manghisi, Elso, to Lusochimica S.p.A. Dimethylamine benzoate or p-anisate catalysed process for the preparation of 4-(nitrophenyl)-dihydropyridines. 6,015,906, Cl. 546-321.000.

Perez, Porfirio J.: *See—*
Beard, Michael E.; Perez, Porfirio J.; Smoak, James F.; Hanzlik, Edward C.; Fromm, Paul M.; and Kulbida, Ihor, 6,016,409, Cl. 399-33.000.

Perez, Sergio M.; and Yap, Walter N., to Sensormatic Electronics Corporation. Mounting bracket for a camera base. 6,015,123, Cl. 248-220.100.

Perka, Alan T.; and Perka, Cathy S. Workstation signal device. 6,014,942, Cl. 116-309.000.

Perka, Cathy S.: *See—*
Perka, Alan T.; and Perka, Cathy S., 6,014,942, Cl. 116-309.000.

Perkin-Elmer Corporation, The: *See—*
Atwood, John Girdner, 6,015,534, Cl. 422-102.000.

Perkin-Elmer Corporation Applied Biosystems Division: *See—*
Woudenberg, Timothy M.; Bodner, Kevin S.; Connell, Charles R.; Shigeura, John; Tracy, David H.; and Young, Eugene F., 6,015,674, Cl. 435-6.000.

Perkin-Emer Corporation, The: *See—*
Sharaf, Muhammad A., 6,015,667, Cl. 435-6.000.

Perreaut, Pierre: *See—*
Ferrari, Bernard; Gougat, Jean; Muneaux, Claude; Muneaux, Yvette; Perreaut, Pierre; and Planchenault, Claudine, 6,015,812, Cl. 514-235.800.

Pershing, John Arthur, Jr.: *See—*
Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Gopal, Ajei Sarat; Kirby, Orvalle Theodore; Pershing, John Arthur, Jr.; Blount, Marion Lee; Kaplan, Marc Adam; and Turek, John Joseph Edward, 6,016,505, Cl. 709-205.000.

Persson, Per-Oskar: *See—*
Haugen, Ketil; Ohlsson, Håkan; and Persson, Per-Oskar, 6,015,453, Cl. 96-195.000.

Pet Care Systems: *See—*
Sladek, James H.; Hughes, S. Michael; and House, Roy F., 6,014,947, Cl. 119-171.000.

Petefish, William G.: *See—*
Banks, Donald R.; Pofahl, Ronald G.; Sylvester, Mark F.; Petefish, William G.; and Fischer, Paul J., 6,015,722, Cl. 438-108.000.

Petermeier, Norman B.: *See—*
Kelly, Matthew F.; Kelly, Bryan M.; Petermeier, Norman B.; Kroeckel, John G.; and Link, John E., 6,015,344, Cl. 463-16.000.

Peters, Hartmut: *See—*
Scholz, Werner; Bachnick, Werner; Streckenbach, Wulf-Christian; Wessolly, Bernd; Voessing, Walter; Peters, Hartmut; Schroeder, Ernst F.; Timmermann, Friedrich; Meunier, Paul-Louis; and Artigalas, Max, 6,016,233, Cl. 360-15.000.

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Sacchetti, Gentile, 6,015,249, Cl. 409-186.000.

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MacDonald, Lorne; and Pockrandt, Don, 6,014,880, Cl. 72-181.000.

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Wright, James R., Jr.; and Pohajdak, Bill, 6,015,713, Cl. 435-378.000.

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Fortune, G. Clark; Waraksa, Thomas J.; Spring, James K.; and Prainito, John D., 6,016,102, Cl. 340-442.000.

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Lozon, Robert J.; and Olszewski, Edward C., 6,015,961, Cl. 219-69.150.

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Evans, Dale M, 6,014,915, Cl. 74-606.00R.

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Jacobsen, Stephen C.; and Davis, Clark, 6,014,919, Cl. 83-282.000.

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Rando, Robert R., 6,015,877, Cl. 530-326.000.

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Rashman, Richard; and Shick, Dennis, 6,015,024, Cl. 181-131.000.

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Tanaka, Yoshihiko; Tsuzuku, Takashi; Takahashi, Takayuki; and Suzuki, Akihiro, 6,014,926, Cl. 99-487.000.

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Liu, Shu-Ming, 6,015,971, Cl. 250-231.130.

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Thornton, Troy; and Lau, Lilip, 6,015,431, Cl. 623-1.000.

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Shen, Jerome L.; and Bryan, Barbara A., 6,015,785, Cl. 514-2.000.

Provino, Vincent J.: *See—*
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Le Boudec, Jean-Yves; Przygienda, Antoni B.; and Sultan, Robert, 6,016,306, Cl. 370-235.000.

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Jurek, Waldemar Robert; and Puchalski, Arthur, 6,014,780, Cl. 4-613.000.

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Deaner, Michael J.; Puppin, Joseph; and Heikkila, Kurt E., 6,015,611, Cl. 428-326.000.
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Le Bris, Louis, 6,015,924, Cl. 562-524.000.

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Overby, Linwood Hugh, Jr.; and Rajaraman, Balachandar, 6,016,503, Cl. 709-104.000.

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Cook, Lacy G., 6,016,220, Cl. 359-351.000.
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Dale, Roderic M. K.; Arrow, Amy; Srivastava, Suresh C.; and Raza, Syed K., 6,015,886, Cl. 536-23.100.

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Guttag, Karl M.; and Read, Christopher J., 6,016,538, Cl. 712-32.000.

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Chen, Hong; Stovall, Ross W; and Carlson, Carl, 6,016,290, Cl. 369-13.000.

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Harmon, Paul A.; Cabral-Lilly, Donna J.; Franklin, J. Craig; Reed, Robert A.; and Janoff, Andrew S., 6,015,716, Cl. 436-501.000.

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Daniele, Robert A.; Esteves, Anthony; Reinemuth, George Horst; and Branco, Richard Paul, 6,014,851, Cl. 53-430.000.

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Greuel, Walter J., Jr.; Pieslak, George; Renteria, Efrain; Simpson, Stanley; Vansant, Jan L.; and Wallace, Barnie A., Jr., 6,015,600, Cl. 428-34.900.

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Brown, L. Edward; and Resch, Adam R., 6,015,377, Cl. 600-9.000.

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Walker, David H.; and Yu, Xue-Jie, 6,015,691, Cl. 435-69.100.

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Kostyniak, Paul J.; Giese, Rossman F.; Costanzo, Patricia M.; and Syracuse, Joseph A., 6,015,816, Cl. 514-299.000.

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Cook, C. Edgar; Kepler, John A.; Shetty, Rupa S.; Bartley, Gary S.; and Lee, David Yue-wei, 6,015,805, Cl. 514-176.000.

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Faris, Sadeg M., 6,016,159, Cl. 348-57.000.

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Ritchie, Steven D.; and Reynard, Harlie David, 6,015,086, Cl. 231-2.500.

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Maitre, Jean-Paul; Mentech, Julio; Reynaud, Sylvie; and Wong, Emile, 6,015,466, Cl. 127-30.000.

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Duvert, Patrice, 6,015,802, Cl. 514-141.000.

Rhone-Poulenc Inc.: *See—*
Wu, Tai-Teh, 6,015,910, Cl. 548-367.700.

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Swensen, Jeffrey E.; Nolan, Terence J.; Spence, J. Loyd; and Rhyne, Edward P., 6,015,152, Cl. 277-321.000.

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Sanchez, Michael; Khatib, Khaled M.; and Rice, David K., II, 6,015,615, Cl. 428-352.000.

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Kaiser, Heinz-Peter; Richter, Klaus-Jürgen; and Müller, Niclas, 6,015,448, Cl. 75-560.000.

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Coombs, Christopher E.; Richter, Robert J.; Peel, Richard M.; and Fordham, Andrew J., 6,016,160, Cl. 348-61.000.

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Komatsu, Manabu, 6,016,359, Cl. 382-162.000.
Koseko, Hisaaki, 6,015,514, Cl. 264-40.100.
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Ota, Yuichi, 6,016,134, Cl. 345-104.000.
Shinomiya, Kiyohiko, 6,016,430, Cl. 455-515.000.

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Miller, Bradley N.; Konstan, Joseph A.; and Riedl, John T., 6,016,475, Cl. 705-1.000.

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Buttgen, Heinz; Burger, Konrad; Callenbach, Tilo; Mazenauer, Karl; Riesen, Daniel; and Vuille, Daniel, 6,015,396, Cl. 604-192.000.

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Rilbe, Ulf, to Scandrive Control AB. Adjusting device for providing changes of the angle of rotation between two rotary elements. 6,014,907, Cl. 74-395.000.
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Rimkus, Ronald J., to AMTEC Products, Inc. Oral cleaning apparatus. 6,015,293, Cl. 433-141.000.
Rioux, Marc; and Paquet, Eric, to National Research Council of Canada. Method of searching three-dimensional images. 6,016,487, Cl. 707-2.000.
Rishton, Michael Lyne; Newman, Harold Leonard; and Goldenberg, Alec, to Medsol, Corp. Biopsy needle structure. 6,015,391, Cl. 600-567.000.
Ritchie, David John; Munns, Gordon Richard; Forrester, Julie; Standen, Michael Charles Henry; Worthington, Paul Anthony; and Jones, Raymond Vincent Heavon, to Zeneca Limited. Process for the preparation of 2-(6-substituted pyrid-2-yloxymethyl) phenylacetate. 6,015,905, Cl. 546-288.000.
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Rite-Hite Holding Corporation: *See*—
Thill, Gregory J., 6,014,844, Cl. 52-173.200.
Ritscher, James Stephen: *See*—
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Ritter, Rogers C.: *See*—
Werp, Peter R.; Blume, Walter M.; Creighton, Francis M., IV; and Ritter, Rogers C., 6,015,414, Cl. 606-108.000.
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Kelly, Matthew F.; Kelly, Bryan M.; Petermeier, Norman B.; Kroeckel, John G.; and Link, John E., 6,015,344, Cl. 463-16.000.
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Roslund, Richard N., Jr.; Nelson, Patrick; Wilkerson, Larry Allen; Roark, Troy; Dral, Joel; Simpson, Steve; and Clark, John, 6,015,187, Cl. 297-300.400.
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Eberspächer, Helmut; Gauch, Winfried Hardy; Haf, Helmut; and Robel, Wolfgang, 6,016,035, Cl. 315-82.000.
Roberson, Kenneth Wayne, to International Business Machines Corporation. Method and apparatus for an object-oriented object for retrieving information from local and remote databases. 6,016,496, Cl. 707-103.000.
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Decker, Heinz, 6,015,194, Cl. 303-155.000.
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Key, Al; Lemke, Gregory; Meinke, Charles W.; and Schilling, Ronald J., 6,015,278, Cl. 418-82.000.
Roberts, Richard L.: *See*—
Siddiqui, Mukhtar; Roberts, Richard L.; and Greene, James A., 6,015,548, Cl. 424-59.000.
Roberts, Russell Bradley, to MEMC Electronic Materials, Inc. Apparatus for dressing inside diameter saws. 6,015,335, Cl. 451-72.000.
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Barnes, Gregory; Skekloff, Jon; Martin, David D.; and Ray, Douglas, 6,016,096, Cl. 337-123.000.
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Butts, Lawrence D.; Robinson, Charles L.; Simpson, Douglas; and Dery, Joseph L., 6,015,302, Cl. 439-76.200.
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Echeverry, Jan M.; Fernandez, Luis M.; Jervis, James E.; Robinson, Janine C.; Tanaka, Shigeru; and Voss, Laveille K., 6,015,421, Cl. 606-190.000.
Robinson, John Dennis: *See*—
Anderson, Thomas B.; Drucker, Elliott; and Robinson, John Dennis, 6,015,451, Cl. 95-184.000.
Rochl, Maximilian, to Hanspeter Hau. PM hot-work steel and method of producing the same. 6,015,446, Cl. 75-243.000.
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Tuomanen, Elaine; and Masure, H. Robert, 6,015,560, Cl. 424-150.100.
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Yamamoto, Harry Y.; Bugos, Robert C.; and Rockholm, David C., 6,015,939, Cl. 800-278.000.
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Bogensberger, Erik F.; Burns, Matthew L.; and Rambo, Jeffery C., 6,016,121, Cl. 342-357.120.
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Walch, Hatto, 6,015,578, Cl. 424-464.000.
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Roe, Fred L.: *See*—
Becker, David S.; Blalock, Guy T.; and Roe, Fred L., 6,015,760, Cl. 438-714.000.
Roe, Jeffery N.: *See*—
Nathel, Howard; Cartland, Harry E.; Colston, Billy W., Jr.; Everett, Matthew J.; and Roe, Jeffery N., 6,015,969, Cl. 250-227.270.
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Douglas, Joel S.; Roe, Jeffrey N.; Radwanski, Ryszard; and Duchon, Brent G., 6,015,392, Cl. 600-583.000.
Rogers, John A.: *See*—
Fuchs, Martin; Rogers, John A.; and Banet, Matthew J., 6,016,202, Cl. 356-432.00T.
Rogers, Nancy G. Dog teething toy. 6,014,950, Cl. 119-710.000.
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Jamasbi, Homayoun; Wohltmann, Kenneth Everett; and Spanier, Joseph John, 6,015,871, Cl. 528-48.000.
Rohm Co., Ltd.: *See*—
Nishimura, Kiyoshi, 6,016,266, Cl. 365-145.000.
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Rolandi, Pier Luigi: *See*—
Gerna, Danilo; Canegallo, Roberto; Chioffi, Ernestina; Pasotti, Marco; and Rolandi, Pier Luigi, 6,016,272, Cl. 365-185.210.
Roldan, Judith Marie: *See*—
Angelopoulos, Marie; Brusic, Vlasta A.; Graham, Teresita Ordonez; Purushothaman, Sampath; Saraf, Ravi F.; Shaw, Jane Margaret; Roldan, Judith Marie; and Viehbeck, Alfred, 6,015,509, Cl. 252-500.000.
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Roller, George J.: *See*—
Silverberg, Morton; and Roller, George J., 6,016,205, Cl. 358-1.600.
Rolls, John A.: *See*—
Miller, Charles G.; Rolls, John A.; and Hastings, Otis H., 6,015,965, Cl. 219-213.000.
Romanczyk, Leo J., Jr.: *See*—
Kealey, Kirk S.; Snyder, Rodney M.; Romanczyk, Leo J., Jr.; Hammerstone, John F., Jr.; Buck, Margaret M.; and Cipolla, Giovanni G., 6,015,913, Cl. 549-386.000.
Romano, Edward A. Golf swing stroke-error-signalling sensor. 6,015,353, Cl. 473-236.000.
Romano, Teresa J. Jewelry system. 6,014,871, Cl. 63-41.000.
Romero Salvo, Gerardo Antonio, to Delta Graf S.A. Wetting systems for offset printing and a mechanism for their application. 6,015,140, Cl. 261-36.100.
Romestant, Michel: *See*—
Boudet, Alain; Pettenati, Jacqueline; Goffner, Deborah; Halpin, Claire; O'Connell, Ann; Romestant, Michel; Boerjan, Wout; and Leple, Jean-Charles, 6,015,943, Cl. 800-298.000.
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Cline, David J.; and Rosenau, Paul, 6,016,020, Cl. 307-125.000.
Rosenbaum, Saul: *See*—
Gershen, Bernard; Rosenbaum, Saul; and Pearse, James N., 6,016,244, Cl. 361-50.000.
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Reed, David B.; Cooper, Mark; Rosink, Kenneth E.; and Ziaja, Henry J., 6,014,893, Cl. 73-49.700.

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Ross, Paul C.: *See—*
Dickinson, Alexander George; McPherson, Ross; Mendis, Sunetra; Ross, Paul C.; and Tyson, John A., 6,016,355, Cl. 382-124.000.

Ross, Steven L., to Intel Corporation. Voltage overshoot protection circuit. 6,016,245, Cl. 361-86.000.

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Roth, Noah M., to Micro Therapeutics, Inc. Rolled stent with waveform perforation pattern. 6,015,433, Cl. 623-1.000.

Rothstein, Kurt A.: *See—*
Mastain, Steven A.; Peck, Wallace A.; Simplair, Diana M.; and Rothstein, Kurt A., 6,016,242, Cl. 360-119.000.

Roussev, Jeorge Konstantinov: *See—*
Trifonov, Borislav Borisov; Roussev, Jeorge Konstantinov; and Boshev, Nikola Atanassov, 6,015,878, Cl. 530-329.000.

Rouzegar, Mirsaeed: *See—*
Osgar, Michael L.; and Rouzegar, Mirsaeed, 6,015,068, Cl. 222-400.700.

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Brookes, Graham Robert; Clare, David Andrew; Green, Phillip James; Smith, Richard John; and Woodhouse, Richard Graham, 6,015,155, Cl. 280-5.505.

Rowland, Kathleen: *See—*
Ross, Jeffrey R.; and Rowland, Kathleen, 6,015,400, Cl. 604-506.000.

Rozakis, George W.: *See—*
Valunin, Igor; and Rozakis, George W., 6,015,435, Cl. 623-6.000.

Rozsypal, Antonin: *See—*
Kadanka, Petr; and Rozsypal, Antonin, 6,016,017, Cl. 307-64.000.

Rubin, Steven A.: *See—*
Fromson, Howard A.; Gracia, Robert F.; and Rubin, Steven A., 6,014,931, Cl. 101-465.000.

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Lloyd, Lester John; Lloyd, Peter M.; Rubsamen, Reid M.; and Schuster, Jeffrey Arthur, 6,014,969, Cl. 128-200.140.

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Durant, Gregory M.; and Rutledge, Christopher L., 6,016,212, Cl. 359-124.000.

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Tanaka, Tatsuaki; Suhara, Toshihiro; Matsumoto, Toshihiro; Sagara, Hiroaki; and Maeda, Yoshihiko, 6,015,021, Cl. 180-206.000.

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Mizumachi, Motohiro; Shinohara, Satoru; and Saito, Kenichi, 6,015,240, Cl. 400-241.000.

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Naruo, Takeshi; Saito, Takeshi; and Noguchi, Shuichi, 6,014,887, Cl. 73-12.040.

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Katsuno, Ryuji; Kobayashi, Masanori; Okuno, Tatsuo; Ando, Chikara; Arai, Kazuhiko; Kitano, Yoshihisa; Katsuta, Nobuhiro; and Sakaguchi, Yasuo, 6,016,417, Cl. 399-308.000.

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Okabayashi, Takahiro; Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Terayama, Yoshimi; Sakaki, Takashi; Ikegami, Yuichi; Kondo, Kazuo; Tamura, Yoichi; and Nakatsuka, Yasuo, 6,015,081, Cl. 228-180.220.

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Yamazaki, Shunpei; Sakama, Mitsunori; and Hiroki, Masaaki, 6,015,762, Cl. 438-788.000.

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Kawakita, Yoshihiro; Hasegawa, Masanaru; Sakamoto, Kazunori; and Hatanaka, Hideo, 6,015,872, Cl. 528-102.000.
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Park, Jong Wook, 6,015,631, Cl. 428-690.000.

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An, Joong-il; Kim, Kyung-su; Lim, Jung-su; and Kim, Jung-ki, 6,015,758, Cl. 438-706.000.
Baek, Seung-Ung, 6,016,165, Cl. 348-441.000.
Blonstein, Steve; Chaney, Jack; Gillespie, Donald; and Wood, Eric, 6,016,144, Cl. 345-342.000.
Cho, Won-Mo, 6,015,148, Cl. 271-164.000.
Choi, Chi-Young, 6,015,723, Cl. 438-123.000.
Ha, Jong-ho, 6,015,204, Cl. 347-37.000.
Huh, Jun-Ho, 6,016,172, Cl. 348-845.100.
Kim, Hong-Ki; Lee, Duck-Hyung; and Choi, Chang-Sik, 6,015,748, Cl. 438-592.000.

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Kim, In-seop; Kim, Seung-uhn; You, Nam-hee; and Lee, Soon-young, 6,015,706, Cl. 435-252.100.
Kim, Jae-in; and Yoo, Han-joo, 6,014,865, Cl. 62-151.000.
Kim, Jin-gu, 6,016,168, Cl. 348-661.000.
Kim, Yang Sung, 6,016,559, Cl. 714-48.000.
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Mascarenhas, Desmond; and Sanders, Martin, 6,015,786, Cl. 514-12.000.

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Auclair, Daniel L.; and Harari, Eliyahou, 6,016,530, Cl. 711-6.000.

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Patitsas, George Philemon; and Sandstrom, Paul Harry, 6,015,525, Cl. 264-315.000.

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Ness, Richard M.; Partlo, William N.; and Sandstrom, Richard L., 6,016,325, Cl. 372-38.000.

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Chikazawa, Motonori; Kakinaka, Kohichi; and Honda, Shozo, 6,015,281, Cl. 425-226.000.

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Yumoto, Tetsuo, 6,015,523, Cl. 264-129.000.

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Schade, Christian; Wekel, Hans-Ulrich; Sanner, Axel; and Sperling, Karin, 6,015,551, Cl. 424-78.080.

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Ferrari, Bernard; Gougat, Jean; Muneaux, Claude; Muneaux, Yvette; Perreaut, Pierre; and Planchenault, Claudine, 6,015,812, Cl. 514-235.800.

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Hoshiba, Akihiko; and Nakamura, Kazuhiro, 6,015,317, Cl. 440-1.000.
Tanaka, Ko, 6,015,319, Cl. 440-84.000.

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Miyagi, Syogo; Kuwano, Mitsuaki; and Kunou, Noriyuki, 6,015,810, Cl. 514-220.000.

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Daifotis, Anastasia G.; Yates, A. John; and Santora, Arthur C., II, 6,015,801, Cl. 514-108.000.

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Tosaka, Shigeru; Tachizaki, Syuji; Sato, Kouetu; Takahashi, Yoshihiro; Kimura, Hiroshi; Tajima, Hiroshi; Susukida, Haruki; Sato, Jun; Kojima, Masakazu; Ebiko, Hirotoshi; and Ito, Takeshi, 6,015,953, Cl. 174-79.000.

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Hatakeyama, Mitsuaki; and Ohkubo, Kenichi, 6,016,370, Cl. 382-299.000.
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Kaite, Osamu; Kokuga, Toshiharu; and Toya, Shoichi, 6,016,046, Cl. 320-108.000.
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Saraf, Ravi F.: *See*—
Angelopoulos, Marie; Brusic, Vlasta A.; Graham, Teresita Ordonez; Purushothaman, Sampath; Saraf, Ravi F.; Shaw, Jane Margaret; Roldan, Judith Marie; and Viehbeck, Alfred, 6,015,509, Cl. 252-500.000.

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Andrianov, Alexander K.; Payne, Lendon G.; Sargent, Jonathan R.; and Sule, Sameer S., 6,015,563, Cl. 424-184.100.

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Ansel, George M.; Hunt, Jeffery S.; Saripella, Satish; Anumula, Sudhaker Reddy; and Srikrishna, Ajay, 6,016,277, Cl. 365-189.090.

Sasada, Reiko: *See*—
Watanabe, Tatsuya; Yoshitomi, Sumie; and Sasada, Reiko, 6,015,552, Cl. 424-85.100.

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Suzuki, Fujio; Sasaki, Hidetaka; and Kobayashi, Makiko, 6,015,796, Cl. 514-45.000.

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Koide, Jun; Sasanuma, Nobuatsu; and Ikeda, Yuichi, 6,016,206, Cl. 358-298.000.

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Nakahanada, Manabu; and Satake, Wataru, 6,015,653, Cl. 430-393.000.

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Moroo, Jun; Mikami, Tomohisa; Mori, Masahiro; Chiba, Hirotaka; Nagata, Shigemi; Nakamura, Shigeyoshi; Konaka, Toshio; and Sato, Kazuhiko, 6,016,154, Cl. 345-442.000.

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Nagasawa, Masaya; and Sato, Masatoshi, 6,016,297, Cl. 369-54.000.

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Nagasawa, Koichi; Kawaguchi, Naomi; Shimai, Futoshi; Sato, Mitsuru; Harada, Kouji; and Koshiyama, Jun, 6,015,467, Cl. 134-1.000.

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Matsushita, Mitsumasa; Taniguchi, Takumi; Ohta, Takashi; Sato, Norio; Hoshino, Yuji; Kondo, Kanemitsu; Abe, Naruaki; and Suzuki, Toshiyuki, 6,015,856, Cl. 524-451.000.

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Nakamura, Hidehiro; Satou, Kazuki; and Oguchi, Wataru, 6,015,309, Cl. 439-159.000.

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Jeppesen, Lone; and Sauerberg, Per, 6,015,813, Cl. 514-256.000.

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Hoy, Michael D.; Arya, Deepak; Mason, Stuart; and Saunders, Martyn, 6,016,339, Cl. 379-106.070.

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Weller, Ulrich; and Sauter, Rainer, 6,015,226, Cl. 366-79.000.

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Oku, Teruo; Kayakiri, Hiroshi; Abe, Yoshito; Sawada, Yuki; and Mizutani, Tsuyoshi, 6,015,818, Cl. 514-312.000.

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Terasawa, Hideo; Kondo, Yoshio; Nagano, Naoki; and Sawai, Kunihito, 6,016,139, Cl. 345-169.000.

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Ray, Sabyasachi Sinha; Tuli, Deepak Kumar; Sharma, Meeta; Rai, Madan Mohan; Ghosh, Sobhan; Bhatnagar, Akhilesh Kumar; Saxena, Prabhat Kumar; and Sivaram, Swaminathan, 6,015,768, Cl. 502-300.000.

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Rilbe, Ulf, 6,014,907, Cl. 74-395.000.

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Foster, Robert B., Jr.; Baugh, Charles R.; and Schafer, David C., 6,016,313, Cl. 370-330.000.

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Zimmerman, Achim; Schaffner, Heinz; Polly, Edgar; and Zimmermann, Helmut, 6,016,523, Cl. 710-63.000.

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Lacroix, Roger; Mheidle, Mickael; and Scheibli, Peter, 6,015,454, Cl. 106-31.470.

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Waldo, James H.; Wollrath, Ann M.; Scheifler, Robert; and Arnold, Kenneth C.R.C., 6,016,500, Cl. 707-202.000.

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Rosenberg, Louis B.; Schena, Bruce M.; Brave, Scott B.; and Jackson, Bernard G., 6,015,473, Cl. 156-293.000.

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Shaw, Schuyler Scott; and Schenk, Donald Edward, 6,014,862, Cl. 60-533.000.

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Blank, Norman E.; and Schenkel, Hubert K., 6,015,865, Cl. 525-524.000.

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Ramos, Rogerio Tadeu; and Stephenson, Kenneth, 6,016,191, Cl. 356-70.000.

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Rodriguez, Arturo A.; Patel, Neilesh R.; and Simerly, Timothy W., 6,016,163, Cl. 348-420.000.

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Wulfman, Edward; Gordon, Lucas; Barry, Robert; Shuman, Brandon; Dillard, David; and Chandrasekaran, Verivada, 6,015,420, Cl. 606-168.000.

Scoccia, Ardeean, to General Motors Corporation. Method for assembling shaft of rotating valve door between a pair of housings. 6,015,340, Cl. 454-69.000.

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Jackson, Roger P., 6,015,409, Cl. 606-61.000.

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Fahley, Terry R., 6,015,000, Cl. 156-539.000.
Mastain, Steven A.; Peck, Wallace A.; Simplair, Diana M.; and Rothstein, Kurt A., 6,016,242, Cl. 360-119.000.
Motzko, Andrew R.; Korbel, Garry E.; Baker, John M.; and Francis, Stuart K., 6,016,043, Cl. 318-606.000.

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Ruppi, Sakari, 6,015,614, Cl. 428-335.000.

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Kelly, Ronald W, 6,016,465, Cl. 702-116.000.

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Maes, Stephane Herman; and Sedivy, Jan, 6,016,476, Cl. 705-1.000.

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See, Jackie R.; and See, Darryl M., 6,015,576, Cl. 424-450.000.

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Vandenboom, Robert M.; Poole, David L.; Steinbrunner, Steven L.; and Seffernick, Lewis L., 6,014,900, Cl. 73-781.000.

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Lischewski, Regina; Sell, Ursula; Marx, Jörg; and Gohs, Uwe, 6,015,621, Cl. 428-411.100.

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Kimura, Yoshio; Morita, Satoshi; Matsuyama, Yuji; and Semba, Norio, 6,015,066, Cl. 222-64.000.

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Yamazaki, Shunpei, 6,015,724, Cl. 438-151.000.

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Yamazaki, Shunpei; Sakama, Mitsunori; and Hiroki, Masaaki, 6,015,762, Cl. 438-788.000.

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Tricoli, David M; Carney, Kim J.; and Russell, Paul F., 6,015,942, Cl. 800-280.000.

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Doolittle, James W., 6,015,462, Cl. 118-668.000.
Thompson, Raymon F.; Berner, Robert W.; Curtis, Gary L.; Culliton, Stephen P.; and Wright, Blaine G., 6,014,817, Cl. 34-60.000.

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Yu, Bin; Hu, Chenming; King, Ya-Chin; Pohlman, Jeffrey T.; and Trivedi, Rita, 6,015,999, Cl. 257-497.000.

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Pratt, Michael K., 6,015,156, Cl. 280-11.220.

Seno, Shoichiro: *See*—
Funabe, Chieko; Baba, Yoshimasa; Seno, Shoichiro; and Koui, Yuuji, 6,016,350, Cl. 380-49.000.

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Kuribayashi, Masaki; Hashimoto, Yuichi; Senoo, Akihiro; Ueno, Kazunori; and Tsuzuki, Hidetoshi, 6,016,037, Cl. 315-169.300.

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Perez, Sergio M.; and Yap, Walter N., 6,015,123, Cl. 248-220.100.

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Martin, James L.; Sirjani, Abolfazl; Seppi, Kevin D.; and Keeler, Lisa S., 6,016,501, Cl. 707-203.000.

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Facchini, Angelo; and Serapiglia, Antonio, 6,016,391, Cl. 395-500.220.

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Boutillon, Christophe; Martinon, Frederic; Sergheraert, Christian; Magne, Remy; Gras-Masse, Helene; Gomard, Elisabeth; Tartar, Andre; and Levy, Jean-Paul, 6,015,564, Cl. 424-208.100.

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Deao, Douglas E.; and Seshan, Natarajan, 6,016,555, Cl. 714-35.000.

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Seto, Hidekazu: *See*—
Takasawa, Takeharu; Ito, Hiroyuki; Sato, Shoji; Seto, Hidekazu; and Suzuki, Junichi, 6,016,301, Cl. 369-112.000.

Setogawa, Toshiaki: *See*—
Ohashi, Masakazu; Kaminaga, Kozo; Takanashi, Kenji; Setogawa, Toshiaki; Yoshida, Teruyuki; and Tachi, Katsuichi, 6,016,182, Cl. 352-37.000.

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Lee, Shih-Ying, 6,014,800, Cl. 29-25.410.

Setsune, Kentaro: *See*—
Mizuno, Koichi; Enokihara, Akira; Higashino, Hidetaka; and Setsune, Kentaro, 6,016,434, Cl. 505-210.000.

Settle, Kent F.: *See*—
Chu, Lon-Chan; Yaacovi, Yoram; and Settle, Kent F., 6,016,508, Cl. 709-223.000.

Seufert, Robert: *See*—
Dorfschmid, Jens; John, Thomas; and Seufert, Robert, 6,015,031, Cl. 192-3.580.

Sextant Avionique: *See*—
Baudou, Joël; and Leger, Alain, 6,014,769, Cl. 2-6.100.

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Papallo, Thomas F., Jr.; Seymour, Raymond K.; and Tiwari, Anupam, 6,015,957, Cl. 200-244.000.

Sfez, Rémi: *See*—
Guedes, Yvon; and Sfez, Rémi, 6,016,314, Cl. 370-337.000.

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Reffay, Marius, 6,016,079, Cl. 330-255.000.

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Ghilardelli, Andrea; Mulatti, Jacopo; and Branchetti, Maurizio, 6,016,073, Cl. 327-536.000.

Shah, Virang G.: *See*—
Hayes, Donald J.; Boldman, Michael T.; and Shah, Virang G., 6,015,083, Cl. 228-254.000.

Shaklee Corporation: *See*—
Siddiqui, Mukhtar; Roberts, Richard L.; and Greene, James A., 6,015,548, Cl. 424-59.000.

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Liu, Edward W.; and Shami, Qasim Rashid, 6,016,114, Cl. 341-143.000.

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Sharp Kabushiki Kaisha: *See*—
Bradshaw, Madeline Joan; Jones, John Clifford; Sage, Ian Charles; McDonnell, Damien Gerard; and Gass, Paul Anthony, 6,016,180, Cl. 349-156.000.
Haneda, Isamu; Kihara, Yoshiro; and Morioka, Masami, 6,016,502, Cl. 707-509.000.
Kimura, Takahiko; Ichikawa, Yoshiki; Yamaguchi, Jun; Tsuji, Masahiro; and Sanada, Yoshiaki, 6,016,411, Cl. 399-103.000.

Mitate, Takehito; Torata, Naoto; Minato, Kazuaki; Iida, Toyoshi; Makino, Tetsushi; Hamano, Shigeyuki; and Kameda, Naoyoshi, 6,015,637, Cl. 429-231.100.

Mizuno, Yuuji; Ishimaru, Yoshihiro; and Enomoto, Youichi, 6,016,433, Cl. 505-190.000.

Shimada, Shinji, 6,016,181, Cl. 349-156.000.

Urakawa, Toshio, 6,016,156, Cl. 347-134.000.

Wakahara, Shirou; and Masuda, Kazuya, 6,015,208, Cl. 347-55.000.

Yamauchi, Yasuji; Yamanaka, Toshio; Okumura, Masafumi; Hirai, Masashi; Taka, Kyousuke; Uno, Kinji; Yoneda, Yoshiharu; and Yamauchi, Hirokazu, 6,014,920, Cl. 83-560.000.

Sharp Laboratories of America, Inc.: *See*—

Zhuang, Wei-Wei; Nguyen, Tue; Stecker, Greg Michael; Evans, David Russell; and Hsu, Sheng Teng, 6,015,918, Cl. 556-117.000.

Sharp, Tricia E.: *See*—

Cannon, Terry K.; and Sharp, Tricia E., 6,015,085, Cl. 229-305.000.

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Angelopoulos, Marie; Brusic, Vlasta A.; Graham, Teresita Ordonez; Purushothaman, Sampath; Saraf, Ravi F.; Shaw, Jane Margaret; Roldan, Judith Marie; and Viehbeck, Alfred, 6,015,509, Cl. 252-500.000.

Shaw, L. Brandon: *See*—

Harbison, Barry B.; Sanghera, Jasbinder S.; Shaw, L. Brandon; and Aggarwal, Ishwar D., 6,015,765, Cl. 501-40.000.

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Carroll, David John; and Shaw, Wade David, 6,016,507, Cl. 709-217.000.

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Shay, Michael John, to National Semiconductor Corporation. Internal source clock generation circuit for use with power management scheme. 6,016,071, Cl. 327-294.000.

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Shearis, Susan C.: *See*—

Cowperthwaite, George F.; Johnston, Allen D.; and Shearis, Susan C., 6,015,549, Cl. 424-61.000.

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Miura, Mareki; and Ohnuma, Yoshinobu, 6,015,873, Cl. 528-157.000.

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Elion, Wiveka Jacoba; Klein Nagelvoort, Robert; and Vink, Jan Kornelis, 6,014,869, Cl. 62-621.000.

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Juran, Carleen J.; Yakimow, Kristin; Shelton, Michael B.; Stroebel, John C.; Markowitz, H. Toby; Vatterott, Pierce; and Strandquist, Harry A., 6,016,447, Cl. 607-27.000.

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Kholodenko, Arnold; Lee, Ke Ling; Shendon, Maya; and Quiles, Efrain, 6,015,465, Cl. 118-719.000.

Sheng, Tony L., to Honeyware, Inc. All-plastic shelf unit module having a sliding drawer. 6,015,053, Cl. 211-188.000.

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Filanovsky, Boris; Burenko, Tat'yana; Kuselman, Ilya; Simantov, David; and Shenhar, Avinoam, 6,015,522, Cl. 264-105.000.

Shepard, H. Michael: *See*—

Hudziak, Robert Michael; Shepard, H. Michael; and Ullrich, Axel, 6,015,567, Cl. 424-277.100.

Sherman, John Henry: *See*—

Brodsky, William Louis; Chan, Benson; Myrto, Glenn Edward; and Sherman, John Henry, 6,015,301, Cl. 439-73.000.

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Shetterly, Donivan M.: *See*—

Schnabel, James P., Jr.; Shetterly, Donivan M.; and Malby, Robert E., Jr., 6,015,619, Cl. 428-410.000.

Shetty, Rupa S.: *See*—

Cook, C. Edgar; Kepler, John A.; Shetty, Rupa S.; Bartley, Gary S.; and Lee, David Yue-wei, 6,015,805, Cl. 514-176.000.

Shiba, Masataka: *See*—

Noguchi, Minori; Kenbo, Yukio; Oshida, Yoshitada; Shiba, Masataka; Yoshitaka, Yasuhiro; and Murayama, Makoto, 6,016,187, Cl. 355-53.000.

Shibano, Teruo: *See*—

Horikawa, Tsuyosi; Makita, Tetsuro; Kuroiwa, Takeharu; Mikami, Noboru; and Shibano, Teruo, 6,015,989, Cl. 257-309.000.

Shick, Dennis: *See*—

Rashman, Richard; and Shick, Dennis, 6,015,024, Cl. 181-131.000.

Shido, Ryuichi: *See*—

Fukuda, Takeshi; and Shido, Ryuichi, 6,015,456, Cl. 106-286.500.

Shields, Henry: *See*—

Rieger, Harry; Shields, Henry; and Foster, Richard, 6,016,324, Cl. 372-25.000.

Shields, Rick L.: *See*—

Mehta, Rajendra; Doll, Gary; Dotson, Mark; Lakes, A. Dale; and Shields, Rick L., 6,015,589, Cl. 427-152.000.

Shigemoto, Hiromi: *See*—

Morizono, Kenichi; Okada, Keiji; Shigemoto, Hiromi; and Kawachi, Hideshi, 6,015,625, Cl. 428-500.000.

Shigeno, Nobuyuki: *See*—

Kataoka, Hideo; Shigeno, Nobuyuki; Munakata, Masaki; and Urabe, Tetsuo, 6,016,178, Cl. 349-117.000.

Shigeta, Kazuo: *See*—

Imamura, Yutaka; Taniguchi, Tatsuaki; and Shigeta, Kazuo, 6,016,128, Cl. 343-741.000.

Shigeura, John: *See*—

Woudenberg, Timothy M.; Bodner, Kevin S.; Connell, Charles R.; Shigeura, John; Tracy, David H.; and Young, Eugene F., 6,015,674, Cl. 435-6.000.

Shih, Yi-Chi: *See*—

Qiu, Cindy Xing; Shih, Yi-Chi; and Yip, Lap Sum, 6,016,092, Cl. 333-262.000.

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Shima, Masahiro; and Sonomura, Minoru, 6,014,874, Cl. 66-106.000.

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Shimai, Futoshi: *See*—

Nagasawa, Koichi; Kawaguchi, Naomi; Shimai, Futoshi; Sato, Mitsuru; Harada, Kouji; and Koshiyama, Jun, 6,015,467, Cl. 134-1.000.

Shimano, Inc.: *See*—

Fukuda, Masahiko, 6,015,036, Cl. 192-217.000.

Masahiro, Yamanaka, 6,014,913, Cl. 74-594.100.

Matsuo, Nobuyuki, 6,015,159, Cl. 280-238.000.

Oda, Hiromi; Okajima, Shinpei; and Sugimoto, Masanori, 6,014,910, Cl. 74-502.600.

Oda, Hiromi, 6,015,118, Cl. 248-65.000.

Ueda, Yutaka, 6,014,914, Cl. 74-594.600.

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Maruo, Katsuhiko; Shimizu, Keisuke; and Oka, Masami, 6,016,435, Cl. 600-316.000.

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Chida, Makoto; Iwata, Kazuo; and Shimoda, Akiyoshi, 6,016,519, Cl. 710-19.000.

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Fushimi, Masaki; and Inazawa, Shintaro, 6,015,867, Cl. 526-124.900.
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Jäger, Heimo; and Köstler, Werner, 6,016,055, Cl. 324-165.000.
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Lauper, Alfred, 6,016,129, Cl. 343-867.000.

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Kinlen, Patrick John; Silverman, David Charles; and Hardiman, Christopher John, 6,015,613, Cl. 428-332.000.

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Rodriguez, Arturo A.; Patel, Neilesh R.; and Simerly, Timothy W., 6,016,163, Cl. 348-420.000.

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Mastain, Steven A.; Peck, Wallace A.; Simplair, Diana M.; and Rothstein, Kurt A., 6,016,242, Cl. 360-119.000.

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Butts, Lawrence D.; Robinson, Charles L.; Simpson, Douglas; and Dery, Joseph L., 6,015,302, Cl. 439-76.200.

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Day, Michael Norman; Frye, Jesse Charles; Seen, Aylwin Yim; and Simpson, Philip McArthur, 6,016,400, Cl. 395-712.000.

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Greuel, Walter J., Jr.; Pieslak, George; Renteria, Efrain; Simpson, Stanley; Vansant, Jan L.; and Wallace, Barnie A., Jr., 6,015,600, Cl. 428-34.900.

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Roslund, Richard N., Jr.; Nelson, Patrick; Wilkerson, Larry Allen; Roark, Troy; Dral, Joel; Simpson, Steve; and Clark, John, 6,015,187, Cl. 297-300.400.

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Swartzel, Kenneth R.; and Simunovic, Josip, 6,015,231, Cl. 374-102.000.

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Rudolf, Hans-Joachim; Simuttis, Arnold; and Rudolph, Axel, 6,015,141, Cl. 267-140.120.

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Bronicki, Lucien Y.; Sinai, Joseph; Doron, Benjamin; and Kaplan, Uri, 6,014,856, Cl. 60-39.120.

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Labrie, Fernand; Merand, Yves; and Singh, Shankar M., 6,015,806, Cl. 514-178.000.

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Emalfarb, Mark Aaron; Ben-Bassat, Arie; and Sinitsyn, Arkady Panteleimonovich, 6,015,707, Cl. 435-263.000.

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McNabb, Andrew J.; and Sink, R. Merritt, 6,015,445, Cl. 71-28.000.

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Martin, James L.; Sirjani, Abolfazl; Seppi, Kevin D.; and Keeler, Lisa S., 6,016,501, Cl. 707-203.000.

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Sæbø, Asgeir; and Skarie, Carl, 6,015,833, Cl. 514-558.000.

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Jacobson, Gunnard Kenneth; Jolly, Setsuko Omata; Sedmak, Joseph James; Skatrud, Thomas Joseph; and Wasileski, John Marion, 6,015,684, Cl. 435-67.000.

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Barnes, Gregory; Skekloff, Jon; Martin, David D.; and Ray, Douglas, 6,016,096, Cl. 337-123.000.

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Bruski, Richard S.; Hudson, Larry G.; Jin, Iljoon; Lloyd, David J.; and Skibo, Michael D., 6,015,528, Cl. 266-207.000.

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Potter, David A.; and Skolnik, Paul R., 6,015,787, Cl. 514-12.000.

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Sherwin, Stephen; Klapholz, Sue; and Skoultchi, Arthur, 6,015,708, Cl. 435-325.000.

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Gregory, Charles E., Sr.; Gregory, Charles E., Jr.; and Slade, William A., 6,014,853, Cl. 56-27.500.

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Cramer, Rudolf; and Slavicek, Rudolf, 6,015,291, Cl. 433-57.000.

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Barrett, Paul; and Eisele, Raymund, 6,015,093, Cl. 235-492.000.

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Brookes, Graham Robert; Clare, David Andrew; Green, Phillip James; Smith, Richard John; and Woodhouse, Richard Graham, 6,015,155, Cl. 280-5.505.

Smith, Robert K.: *See*—
Lapatovich, Walter P.; Doell, Gerhard W.; and Smith, Robert K., 6,016,031, Cl. 313-493.000.

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Winter, Kirt Alan; and Smith, Thomas G., 6,015,207, Cl. 347-43.000.

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Widdowson, Katherine L.; Nie, Hong; and Rutledge, Melvin Clarence, Jr., 6,015,908, Cl. 548-207.000.

Smoak, James F.: *See*—
Beard, Michael E.; Perez, Porfirio J.; Smoak, James F.; Hanzlik, Edward C.; Fromm, Paul M.; and Kulbida, Ihor, 6,016,409, Cl. 399-33.000.

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Krasner, Norman F., 6,016,119, Cl. 342-357.060.

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Lengyel, Jerome E.; and Snyder, John, 6,016,150, Cl. 345-426.000.

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Kealey, Kirk S.; Snyder, Rodney M.; Romanczyk, Leo J., Jr.; Hammerstone, John F., Jr.; Buck, Margaret M.; and Cipolla, Giovanni G., 6,015,913, Cl. 549-386.000.

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Almeras, Roland; and Herelier, Patrick, 6,015,078, Cl. 227-10.000.

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Milius, Alain, 6,015,839, Cl. 516-134.000.

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Nitsche, Werner; and Lahme, Norbert, 6,014,798, Cl. 29-2.000.

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Jain, Praveen K.; and Soin, Harpreet, 6,016,258, Cl. 363-17.000.

Solignac, Serge: *See*—
Courel, Jean-Marie; Schruoffeneger, Denis; and Solignac, Serge, 6,015,468, Cl. 156-129.000.

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Taomo, Toshio; and Song, Wang Yan, 6,014,811, Cl. 30-124.000.

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Beavo, Joseph A.; Bentley, Kelley J.; Charbonneau, Harry; and Sonnenburg, William K., 6,015,677, Cl. 435-6.000.

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Horvitz, Eric J.; Markley, Michael E.; and Sonntag, Martin L., 6,016,145, Cl. 345-342.000.

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Lowry, James W., 6,015,061, Cl. 220-287.000.

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Iio, Kenichi; Sakamoto, Koichi; Yamashita, Sadao; Hiratsuka, Toshihiro; Sonoda, Tomiya; and Mikami, Shigeyuki, 6,016,090, Cl. 333-202.000.

Sonomura, Minoru: *See*—
Shima, Masahiro; and Sonomura, Minoru, 6,014,874, Cl. 66-106.000.

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Ohashi, Masakazu; Kaminaga, Kozo; Takanashi, Kenji; Setogawa, Toshiaki; Yoshida, Teruyuki; and Tachi, Katsuichi, 6,016,182, Cl. 352-37.000.

Sony Corporation: *See*—
Amano, Yasunobu; Ichida, Koji; Endo, Naruhiko; Ohshige, Yoichi; and Mizuki, Masahiko, 6,016,030, Cl. 313-414.000.
Fukumoto, Hirohide; Ushirono, Junichi; Nakano, Minoru; and Kataoka, Hideo, 6,016,179, Cl. 349-128.000.
Hirafune, Yasuhiro; and Kikuchi, Akio, 6,015,627, Cl. 428-553.000.
Hirayama, Teruo, 6,015,725, Cl. 438-156.000.
Horigome, Junichi, 6,016,294, Cl. 369-44.360.
Iguchi, Yukinobu; Utsumi, Ichiro; and Saita, Koji, 6,016,028, Cl. 313-402.000.
Ishige, Kiyoshi, 6,016,299, Cl. 369-75.200.
Kataoka, Hideo; Shigeno, Nobuyuki; Munakata, Masaki; and Urabe, Tetsuo, 6,016,178, Cl. 349-117.000.
Kato, Motoki; and Kojima, Takashi, 6,016,362, Cl. 382-232.000.
Kawaguchi, Kunio; and Kondo, Tetsujiro, 6,016,164, Cl. 348-424.000.
Minegishi, Masahiro; Ino, Masumitsu; Kunii, Masafumi; Urazono, Takenobu; and Hayashi, Hisao, 6,015,720, Cl. 438-30.000.
Mizumachi, Motohiro; Shinohara, Satoru; and Saito, Kenichi, 6,015,240, Cl. 400-241.000.
Nihei, Yukari; Matsunaga, Toru; and Tamura, Takashi, 6,016,243, Cl. 360-127.000.
Nito, Keiichi; Yasuda, Akio; Takanashi, Hidehiko; and Yang, Ying Bao, 6,016,133, Cl. 345-89.000.
Takasawa, Takeharu; Ito, Hiroyuki; Sato, Shoji; Seto, Hidekazu; and Suzuki, Junichi, 6,016,301, Cl. 369-112.000.
Takinami, Takashi, 6,016,110, Cl. 340-995.000.
Terasawa, Hideo; Kondo, Yoshio; Nagano, Naoki; and Sawai, Kunihito, 6,016,139, Cl. 345-169.000.
Yamatsu, Hisayuki; Kashiwagi, Toshiyuki; Imanishi, Shingo; and Masuhara, Shin, 6,016,302, Cl. 369-275.400.
Yoshida, Mikio; and Takenouchi, Masaki, 6,016,303, Cl. 369-283.000.

Soprintel S.A.: *See*—
Heubi, Alexandre, 6,016,115, Cl. 341-161.000.

Sorkin, Gregory Bret: *See*—
Kephart, Jeffrey Owen; Morin, Alexandre Guy Georges; Sorkin, Gregory Bret; and Wells, Joseph Warreb, 6,016,546, Cl. 713-200.000.

Soto, Jorge: *See*—
Nickias, Peter N.; McAdon, Mark H.; Patton, Jasson T.; Friedrichsen, Bernard P.; Soto, Jorge; Stevens, James C.; and VanderLende, Daniel D., 6,015,868, Cl. 526-127.000.

Soule, Matthew C.: *See*—
Violette, John A.; Soule, Matthew C.; and Corley, Thomas G., 6,015,264, Cl. 416-146.00A.

SounDesign, L.L.C.: *See*—
Nosenchuck, Daniel M., 6,014,791, Cl. 15-327.100.

Southpac Trust Int'l, Inc.: *See*—
Weder, Donald E.; and Straeter, Joseph G., 6,014,852, Cl. 53-465.000.

Spanier, Joseph John: *See*—
Jamasbi, Homayoun; Wohltmann, Kenneth Everett; and Spanier, Joseph John, 6,015,871, Cl. 528-48.000.

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Jaramillo, Ken; and Spaniol, David Gerard, 6,016,528, Cl. 710-243.000.

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Kafka, James; Newell, Vincent J.; Watts, Michael; and Clark, James, 6,016,323, Cl. 372-20.000.

Speich, Francisco, to Textilma AG. Mechanical loom with pneumatic weft thread insertion with synchronized clamp cutter and reed. 6,014,992, Cl. 139-435.100.

Spence, J. Loyd: *See*—
Swensen, Jeffrey E.; Nolan, Terence J.; Spence, J. Loyd; and Rhyne, Edward P., 6,015,152, Cl. 277-321.000.

Spencer, David: *See*—
Elliott, Terrence Charles; Nevill, Gary John; Byrne, Ian Kenneth; Adams, Anthony Mason; Courtney, M Lyle; and Spencer, David, 6,015,248, Cl. 408-204.000.

Sperling, Karin: *See*—

Schade, Christian; Wekel, Hans-Ulrich; Sanner, Axel; and Sperling, Karin, 6,015,551, Cl. 424-78.080.
Spiegelman, Bruce M.: *See*—
Hotamisligil, Gökhan S.; and Spiegelman, Bruce M., 6,015,558, Cl. 424-142.100.
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Spintek Systems, Inc.: *See*—
Dzhragatspanvan, Misak; and Greene, William A., 6,015,502, Cl. 210-793.000.
Spitz, Glenn S.: *See*—
Swartz, Jerome; Barkan, Edward; Spitz, Glenn S.; Katz, Joseph; and Metlitsky, Boris, 6,015,090, Cl. 235-472.000.
Spring, James K.: *See*—
Fortune, G. Clark; Waraksa, Thomas J.; Spring, James K.; and Prainito, John D., 6,016,102, Cl. 340-442.000.
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Spruce, Lyle W.: *See*—
Gyorkos, Albert; and Spruce, Lyle W., 6,015,791, Cl. 514-18.000.
Spykerman, David J.: *See*—
Adomeit, Mark E.; Fellows, Kevin J.; Cannon, Philip P.; Spykerman, David J.; and Nothwehr, Rollin E., 6,015,071, Cl. 224-42.340.
SRI International: *See*—
Ventura, Susanna C.; Narang, Subhash C.; Hum, Georgina; Liu, Peikang; Ranganathan, Prema; and Sun, Luying, 6,015,638, Cl. 429-307.000.
Srikrishna, Ajay: *See*—
Ansel, George M.; Hunt, Jeffery S.; Saripella, Satish; Anumula, Sudhaker Reddy; and Srikrishna, Ajay, 6,016,277, Cl. 365-189.090.
Srinivasan, Krishna: *See*—
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Hansen, John P.; Gittinger, Robert Paul; and Stence, Ronald W., 6,016,537, Cl. 711-211.000.
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Ternullo, Luigi, Jr.; and Stephens, Michael C., 6,016,072, Cl. 327-535.000.
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Ramos, Rogerio Tadeu; and Stephenson, Kenneth, 6,016,191, Cl. 356-70.000.
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Dorsett, Kenneth Merle; and Stewart, Christopher Sean, 6,015,115, Cl. 244-123.000.
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Hetzel, Herbert; Heck, Patrick; and Stiegler, Andreas, 6,016,321, Cl. 370-458.000.
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Giacomini, Davide, 6,016,078, Cl. 330-253.000.
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Schmidt, Hans Werner; Rahn, Martin; Stockhausen, Werner; Werner, Dietrich; and Hirsch, Martin, 6,015,539, Cl. 423-625.000.
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Krebs, Arthur T.; and Stockley, H. Walker, 6,015,583, Cl. 426-396.000.
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Seifert, Dean Alan; Stoutenburg, Earney; and Vogt, Paul J., 6,015,087, Cl. 235-379.000.
Stovall, Ross W: *See*—
Chen, Hong; Stovall, Ross W; and Carlson, Carl, 6,016,290, Cl. 369-13.000.
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Weder, Donald E.; and Straeter, Joseph G., 6,014,852, Cl. 53-465.000.
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Rose, Timothy M.; Bosch, Marnix L.; and Strand, Kurt, 6,015,565, Cl. 424-229.100.
Strandquist, Harry A.: *See*—
Juran, Carleen J.; Yakimow, Kristin; Shelton, Michael B.; Stroebel, John C.; Markowitz, H. Toby; Vatterott, Pierce; and Strandquist, Harry A., 6,016,447, Cl. 607-27.000.
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Scholz, Werner; Bachnick, Werner; Streckenbach, Wulf-Christian; Wessolly, Bernd; Voessing, Walter; Peters, Hartmut; Schroeder, Ernst F.; Timmermann, Friedrich; Meunier, Paul-Louis; and Artigalas, Max, 6,016,233, Cl. 360-15.000.
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Yonkoski, Roger K.; Strobush, Brian L.; Ludemann, Thomas J.; and Yapel, Robert A., 6,015,593, Cl. 427-379.000.
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Bachmann, Henry C.; Cook, Steven T.; Schubert, James R.; Schubert, John F.; and Strong, Lori E., 6,015,062, Cl. 220-295.000.
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Bach, Alfred; Strube, Karl-Hermann; and Koerwer, Wolfgang, 6,015,685, Cl. 435-69.100.
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Halczenko, Wasyl; and Stump, Craig A., 6,015,817, Cl. 514-301.000.
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Suzuki, Masayuki; and Suda, Shigeyuki, 6,016,223, Cl. 359-577.000.
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Kohyama, Yusuke; and Sudo, Akira, 6,015,731, Cl. 438-243.000.
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Watanabe, Tsuneo; Suganuma, Ryoichi; and Kai, Tadao, 6,016,405, Cl. 396-55.000.
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Mizoshita, Yoshifumi; Yamada, Tomoyoshi; Kuroba, Yasumasa; Kouhei, Toru; Sugawara, Takao; Matsumoto, Masaru; Mase, Hiroyuki; Tsunekewa, Masao; Koganezawa, Shinji; and Aruga, Keiji, 6,016,237, Cl. 360-97.010.
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Oda, Hiromi; Okajima, Shinpei; and Sugimoto, Masanori, 6,014,910, Cl. 74-502.600.
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Le Boudec, Jean-Yves; Przygienda, Antoni B.; and Sultan, Robert, 6,016,306, Cl. 370-235.000.
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Ohta, Yoshiteru, 6,015,885, Cl. 534-637.000.
Shuto, Akira; Hoshi, Hisayuki; and Sanemitsu, Yuzuru, 6,015,774, Cl. 504-221.000.
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Hirafune, Yasuhiro; and Kikuchi, Akio, 6,015,627, Cl. 428-553.000.
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Kamei, Yasuo; Kawaguchi, Takazo; Yamaoka, Hideyuki; and Nakamura, Yoshihisa, 6,015,527, Cl. 266-145.000.
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Sumitomo Sitix Corporation: *See*—
Izumi, Teruo, 6,015,461, Cl. 117-218.000.
Sumitomo Wiring Systems, Ltd.: *See*—
Mori, Keisuke, 6,015,952, Cl. 174-72.00R.
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Ventura, Susanna C.; Narang, Subhash C.; Hum, Georgina; Liu, Peikang; Ranganathan, Prema; and Sun, Luying, 6,015,638, Cl. 429-307.000.
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Cavanaugh, Ken M.; and Callsen, Christian J., 6,016,489, Cl. 707-8.000.
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Lin, Tony; Lur, Water; and Sun, Shih-Wei, 6,015,741, Cl. 438-305.000.

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Berger, Bernd; and Brüggen, Franz, 6,014,882, Cl. 72-229.000.

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Okusawa, Tsutomu; Koyama, Kazuhito; Yamagishi, Masahiko; Hatamiya, Shigeo; Ajiro, Taiko; Sunou, Megumi; and Ishigaki, Yukio, 6,014,863, Cl. 60-653.000.

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Kail, Gianni, 6,015,345, Cl. 463-16.000.

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Amakawa, Koji; and Suranyi, Edward Joseph, 6,016,485, Cl. 705-400.000.

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Kawakami, Kenichi; Susa, Masahiko; Katsuhiko, Kobayashi; Yamada, Akio; Yamashita, Koichi; and Nishio, Naoki, 6,015,975, Cl. 250-492.220.

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Goeb, Claude; and Süss, Karl-Heinz, 6,015,040, Cl. 198-438.000.

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Tosaka, Shigeru; Tachizaki, Syuji; Sato, Kouetu; Takahashi, Yoshihiro; Kimura, Hiroshi; Tajima, Hiroshi; Susukida, Haruki; Sato, Jun; Kojima, Masakazu; Ebiko, Hirotoshi; and Ito, Takeshi, 6,015,953, Cl. 174-79.000.

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Hirosawa, Masaru; Suyama, Tomio; and Torihata, Takatosi, 6,014,868, Cl. 62-407.000.

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Tanaka, Yoshihiko; Tsuzuku, Takashi; Takahashi, Takayuki; and Suzuki, Akihiro, 6,014,926, Cl. 99-487.000.

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Takasawa, Takeharu; Ito, Hiroyuki; Sato, Shoji; Seto, Hidekazu; and Suzuki, Junichi, 6,016,301, Cl. 369-112.000.

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Amano, Tetsuya; Hotta, Yoshihiko; Morohoshi, Kunichika; and Suzuki, Kazumi, 6,015,770, Cl. 503-201.000.

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Fujiwara, Toshiki; Yamashita, Seiji; and Suzuki, Keiichi, 6,015,909, Cl. 548-243.000.

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Inazuru, Tsutomu; and Suzuki, Kenji, 6,015,325, Cl. 445-28.000.

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Narita, Masaki, 6,014,963, Cl. 123-674.000.

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Koide, Hiromichi; Suzuki, Shinya; and Suzuki, Tatsuaki, 6,016,251, Cl. 361-699.000.

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Kabeya, Nobuaki; Takeuchi, Akihiko; Ochiai, Toshihiko; Katoh, Motoi; Miyashiro, Toshiaki; Suzuki, Takehiko; and Kume, Takao, 6,016,418, Cl. 399-314.000.

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Koide, Hiromichi; Suzuki, Shinya; and Suzuki, Tatsuaki, 6,016,251, Cl. 361-699.000.

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Kawazu, Yukio; Suzuki, Toshimitsu; Yuasa, Masayuki; Yokomizo, Yuichi; Majima, Toshiro; Ito, Takao; Nakashima, Takuji; and Nozawa, Akira, 6,015,925, Cl. 564-316.000.

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Matsushita, Mitsumasa; Taniguchi, Takumi; Ohta, Takashi; Sato, Norio; Hoshino, Yuji; Kondo, Kanemitsu; Abe, Naruaki; and Suzuki, Toshiyuki, 6,015,856, Cl. 524-451.000.

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Nakamura, Masao; and Takagishi, Yukio, 6,015,850, Cl. 524-188.000.

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Nosaki, Takefumi; and Takahashi, Toshiharu, 6,016,386, Cl. 395-114.000.

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Ohashi, Masakazu; Kaminaga, Kozo; Takanashi, Kenji; Setogawa, Toshiaki; Yoshida, Teruyuki; and Tachi, Katsuichi, 6,016,182, Cl. 352-37.000.

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Kaneda, Naoya; and Takano, Hironori, 6,016,221, Cl. 359-557.000.

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Yano, Hideaki, 6,015,164, Cl. 280-806.000.

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Suzuki, Nobuhiro; and Furuya, Shuichi, 6,015,789, Cl. 514-15.000.
Watanabe, Tatsuya; Yoshitomi, Sumie; and Sasada, Reiko, 6,015,552, Cl. 424-85.100.

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Yoshida, Mikio; and Takenouchi, Masaki, 6,016,303, Cl. 369-283.000.

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Kanematsu, Daigoro; Takenouchi, Masanori; Otsuka, Naoji; Ujita, Toshihiko; Yano, Kentaro; and Iwasaki, Osamu, 6,015,210, Cl. 347-87.000.

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Unami, Toshihiko; Inoue, Jiro; Yamamoto, Takashi; and Takeshima, Tetsuo, 6,016,024, Cl. 310-345.000.

Takeuchi, Akihiko: *See—*
Kabeya, Nobuaki; Takeuchi, Akihiko; Ochiai, Toshihiko; Katoh, Motoi; Miyashiro, Toshiaki; Suzuki, Takehiko; and Kume, Takao, 6,016,418, Cl. 399-314.000.

Takeuchi, Hiroyuki: *See—*
Ohnishi, Noriyuki; Takeuchi, Hiroyuki; Miyazawa, Kazutoshi; Hachiya, Norihisa; and Nakagawa, Etsuo, 6,015,508, Cl. 252-299.630.

Takeuchi, Kazuya: *See—*
Uematsu, Yoshikatsu; Kuragaki, Naoyoshi; and Takeuchi, Kazuya, 6,015,318, Cl. 440-61.000.

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Tamachkiarowa, Adriana: *See—*
Kirschner, Uwe; Lau, Matthias; Hannemann, Birgit; and Tamachkiarowa, Adriana, 6,015,715, Cl. 436-166.000.

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Törmälä , Pertti; Tamminmäki, Markku; Helevirta, Pertti; and Nigro, Dennis M., 6,015,410, Cl. 606-73.000.

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Häkkinen, Leo; and Laitinen, Timo, 6,015,112, Cl. 242-397.500.

Tamura, Hideki; and Abe, Hideaki, to Matsushita Electric Works, Ltd. Power supply circuit. 6,016,259, Cl. 363-20.000.

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Nihei, Yukari; Matsunaga, Toru; and Tamura, Takashi, 6,016,243, Cl. 360-127.000.

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Okabayashi, Takahiro; Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Terayama, Yoshimi; Sakaki, Takashi; Ikegami, Yuichi; Kondo, Kazuo; Tamura, Yoichi; and Nakatsuka, Yasuo, 6,015,081, Cl. 228-180.220.

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Chen, Cheng Yi; Tan, Lushi; and Tillyer, Richard D., 6,015,926, Cl. 564-442.000.

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Kawaguchi, Takayuki; Nomura, Sumihiro; and Tsujihara, Kenji, 6,015,901, Cl. 546-89.000.

Tanaka Chemical Corporation: *See—*
Mitate, Takehito; Torata, Naoto; Minato, Kazuaki; Iida, Toyoshi; Makino, Tetsushi; Hamano, Shigeyuki; and Kameda, Naoyoshi, 6,015,637, Cl. 429-231.100.

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Sasaki, Yutaka; Nakanishi, Hidefumi; and Tanaka, Hiroaki, 6,016,087, Cl. 333-116.000.

Tanaka, Hiromichi: *See—*
Awaji, Toshio; Otsuki, Nobuaki; Arakawa, Motohiro; and Tanaka, Hiromichi, 6,015,651, Cl. 430-315.000.

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Hosotani, Ichiro; Tanaka, Hiroshi; Fuwa, Naohide; Maeda, Iwao; Kikori, Shigeo; and Kuretake, Ken, 6,014,955, Cl. 123-399.000.

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Watanabe, Yoshiki; Tanaka, Kei; and Hayata, Hiroshi, 6,016,490, Cl. 707-8.000.

Tanaka, Ko, to Sanshin Kogyo Kabushiki Kaisha. Control for marine propulsion. 6,015,319, Cl. 440-84.000.

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Takayama, Takemori; and Tanaka, Yoshikiyo, 6,015,775, Cl. 508-103.000.

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Kimura, Atsunori; Ono, Yoichi; Minamishin, Hayato; Tanaka, Yuji; Ohno, Seiichi; Hata, Hidekazu; Ueda, Hiroyuki; Esaki, Isamu; and Uchida, Atsushi, 6,015,147, Cl. 271-163.000.

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Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; Goodman, Todd A.; Vercande, David J.; Tangeman, Michael R.; Busch, Eric M.; Kripakaran, Raghavan; Jayasimha, Madhigubba G.; Smith, Keith E.; Austin, Mark A.; and Berry, Dana Bruce, 6,016,343, Cl. 379-242.000.

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Matsushita, Mitsumasa; Taniguchi, Takumi; Ohta, Takashi; Sato, Norio; Hoshino, Yuji; Kondo, Kanemitsu; Abe, Naruaki; and Suzuki, Toshiyuki, 6,015,856, Cl. 524-451.000.

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Imamura, Yutaka; Taniguchi, Tatsuaki; and Shigeta, Kazuo, 6,016,128, Cl. 343-741.000.

Tanoue, Masahide: *See—*
Goto, Shinji; Saito, Jun; Ishii, Hiroyuki; Ando, Masao; Watanabe, Yoshiaki; Isoda, Yuzo; Tanoue, Masahide; and Inoue, Ryukichi, 6,016,412, Cl. 399-111.000.

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Shue, Shau-Lin; Tao, Hun-Jan; Tsai, Chia-Shiung; and Huang, Jenn-Ming, 6,015,735, Cl. 438-254.000.
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Boutillon, Christophe; Martinon, Frederic; Sergheraert, Christian; Magne, Remy; Gras-Masse, Helene; Gomard, Elisabeth; Tartar, Andre; and Levy, Jean-Paul, 6,015,564, Cl. 424-208.100.

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Tauber, Daniel Abraham: *See—*
Bowers, John E.; and Tauber, Daniel Abraham, 6,015,980, Cl. 257-99.000.

Taubin, Gabriel: *See—*
Gueziec, Andre Pierre; and Taubin, Gabriel, 6,016,153, Cl. 345-441.000.

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LaVon, Gary Dean; Young, Gerald Alfred; and Taylor, Gregory Wade, 6,015,935, Cl. 604-378.000.

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Taylor, Ronald J. Wind turbine. 6,015,258, Cl. 415-4.400.

Taylor, Steven Michael, to Ford Global Technologies, Inc. Adjustable locking for hood latch. 6,014,876, Cl. 70-240.000.

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Pignolet, Lawrence G.; and Teachout, Jeffrey, 6,016,252, Cl. 361-724.000.

Technology Patents, LLC: *See—*
Mardirossian, Aris, 6,014,932, Cl. 102-200.000.

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Richardson, Hubert, Jr., 6,015,277, Cl. 418-55.400.

Teh, Jin T.: *See—*
Zhang, Qili; Teh, Jin T.; and Kahn, Philippe Richard, 6,016,478, Cl. 705-9.000.

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Schindler, John W., 6,015,222, Cl. 362-490.000.

Tektronix, Inc.: *See—*
Buzak, Thomas S.; Ilcisin, Kevin J.; Martin, Paul C.; Den Biggelaar, Hans J. G. A.; Bruinink, Jacob; Bongaerts, Petrus Franciscus Gerardus; Burgmans, Adrianus Leonardus Josephus; Khan, Babar Ali; and Van Helleputte, Henri Roger Jules Richard, 6,016,032, Cl. 313-493.000.
Chambers, Richard G.; and Naruki, Kenichi, 6,015,205, Cl. 347-37.000.
Heath, Robert J., 6,016,556, Cl. 714-38.000.
Titterington, Donald R.; Meinhardt, Michael B.; Banning, Jeffery H.; and King, Clifford R., 6,015,847, Cl. 523-160.000.

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Huitema, Christian, 6,016,512, Cl. 709-245.000.

Teleflex Incorporated: *See—*
Baughman, James; and Wheeler, Douglas J., 6,016,049, Cl. 320-167.000.

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Stein, Per, 6,016,432, Cl. 455-557.000.

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Diachina, John; and Henry, Raymond C., 6,016,428, Cl. 455-435.000.
Johansson, Nils Anders, 6,016,125, Cl. 343-702.000.
Söderbärg, Anders, 6,015,982, Cl. 257-262.000.

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Jacobs, William R., Jr.; Musser, James M.; and Telenti, Amalio, 6,015,890, Cl. 536-23.700.

Teleparts International, Inc.: *See—*
Smith, Kenneth; Krick, Brent; and Garcia, Alejandro, 6,015,493, Cl. 210-252.000.

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Letarte, Michelle; Massague, Joan; Bernabeu, Carmelo; and Cheifetz, Sela, 6,015,693, Cl. 435-69.100.

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Seitz, Georg; Lach, Joachim; Klein, Ernst-Ludwig; Wolfschläger, Roland; and Sachs, Ekkehard, 6,016,253, Cl. 361-735.000.

Temple, Daniel Anthony: *See—*
Kokkosoulis, George Dimitrios; and Temple, Daniel Anthony, 6,016,550, Cl. 713-400.000.

TenFold Corporation: *See—*
Walker, Jeffrey L., 6,016,394, Cl. 395-701.000.

Teng, Gary Ganghui. Lithographic printing plates having a thin releasable interlayer overlying a rough substrate. 6,014,929, Cl. 101-456.000.

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Chung, Tai-Shung; Hu, Xudong; and Teoh, Soo Khean, 6,015,516, Cl. 264-41.000.

TeraGen Corporation: *See—*
Sollars, Donald L., 6,016,539, Cl. 712-200.000.

Teraoka, Masao: *See—*
Yamazaki, Nobushi; Teraoka, Masao; and Saeki, Takeharu, 6,015,361, Cl. 475-230.000.

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Okabayashi, Takahiro; Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Terayama, Yoshimi; Sakaki, Takashi; Ikegami, Yuichi; Kondo, Kazuo; Tamura, Yoichi; and Nakatsuka, Yasuo, 6,015,081, Cl. 228-180.220.

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Gleizes, Raymond M., 6,015,498, Cl. 210-688.000.

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Tsuji, Kouichi; Yoshida, Yoshihiro; and Uwano, Takashi, 6,015,680, Cl. 435-7.230.

Tetra Laval Holdings & Finance S.A.: *See—*
Sjostrand, Uno, 6,016,200, Cl. 356-375.000.

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Overby, Jerry, 6,015,158, Cl. 280-124.163.

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Pomatto, Lawrence A.; and Tinkham, Ronald B., 6,015,958, Cl. 200-330.000.

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Eaton, Gerald B.; Monahan, Michael J.; and Tipton, Robert J., 6,015,779, Cl. 508-591.000.

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Yumoto, Hideaki, 6,015,267, Cl. 417-54.000.

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Brown, Gary R.; and Toepel, Michael P., 6,014,830, Cl. 42-100.000.

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Hirosawa, Masaru; Suyama, Tomio; and Torihata, Takatosi, 6,014,868, Cl. 62-407.000.

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Fujita, Shigeru, 6,015,515, Cl. 264-40.100.

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Matsuda, Kazuhiko; Toyoda, Hideyoshi; and Harada, Satoshi, 6,015,830, Cl. 514-419.000.

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Anzai, Masato; Mieki, Nariaki; and Toyosato, Yoshinari, 6,016,248, Cl. 361-683.000.

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Kawahara, Tatsuya, 6,015,635, Cl. 429-42.000.
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Cerwin, Robert James; Transue, Deborah M.; and Alpern, Marvin, 6,015,042, Cl. 206-63.300.

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Sandberg, Thomas Michael; and Webinger, George, 6,015,043, Cl. 206-446.000.

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Lin, Qian; Tretter, Daniel R.; Konstantinides, Konstantinos; and Patti, Andrew, 6,016,354, Cl. 382-117.000.

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Chang, Shun-Hwa; Paiva, Joseph V. R.; and Withington, Alan Henry, 6,016,142, Cl. 345-334.000.
Jackson, Michael E.; and Jackson, Richard, 6,016,118, Cl. 342-357.060.
McNabb, Lea Ann; and Gildea, David R., 6,016,120, Cl. 342-357.060.
Nelson, Robert Leonard, Jr., 6,016,117, Cl. 342-352.000.

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Kang, Myung-Chol; Bray, Brian; Lichty, Maynard; Mader, Catherine; and Merutka, Gene, 6,015,881, Cl. 530-339.000.

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Walse, Alan S.; Lang, Harold Keith; Panella, Augusto P.; Triner, Irvin R.; and Tung, Shyh-Lin, 6,015,299, Cl. 439-60.000.

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Yu, Bin; Hu, Chenming; King, Ya-Chin; Pohlman, Jeffrey T.; and Trivedi, Rita, 6,015,999, Cl. 257-497.000.

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Janssens, Robert; Heirbaut, Werner; Van Goethem, Luc; Baeyens, Peter; and Trouillard, Frank, 6,016,420, Cl. 399-397.000.

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Linhart, Georg Peter, 6,015,298, Cl. 439-24.000.

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Wickham, Michael G.; and Wisseman, Philip H., 6,016,371, Cl. 385-10.000.

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Lin, Tony; Tseng, Hua-Chou; and Lur, Water, 6,015,753, Cl. 438-682.000.

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Hashimoto, Kouji; Tsuchiya, Yoshiro; and Matsuda, Kenji, 6,016,408, Cl. 399-27.000.

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Takai, Hisashi; Goda, Hiroki; and Tsuji, Tomoko, 6,015,936, Cl. 604-383.000.

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Mitsumura, Satoshi; and Tsuji, Yoshinori, 6,015,048, Cl. 209-143.000.
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Kawaguchi, Takayuki; Nomura, Sumihiro; and Tsujihara, Kenji, 6,015,901, Cl. 546-89.000.

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Ogawa, Nobuhiro; and Tsukuda, Masanori, 6,016,249, Cl. 361-685.000.

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Mizoshita, Yoshifumi; Yamada, Tomoyoshi; Kuroba, Yasumasa; Kouhei, Toru; Sugawara, Takao; Matsumoto, Masaru; Mase, Hiroyuki; Tsunekewa, Masao; Koganezawa, Shinji; and Aruga, Keiji, 6,016,237, Cl. 360-97.010.

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Tanaka, Yoshihiko; Tsuzuku, Takashi; Takahashi, Takayuki; and Suzuki, Akihiro, 6,014,926, Cl. 99-487.000.

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Kaniewski, Wojciech Kazimierz; Lodge, Jennifer Katherine; and Tumer, Nilgun Ereken, 6,015,940, Cl. 800-279.000.
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Krämer, Wolfgang; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Turberg, Andreas; and Mencke, Norbert, 6,015,823, Cl. 514-374.000.
Turek, John Joseph Edward: *See*—
Badovinatz, Peter Richard; Brenner, Larry Bert; Chandra, Tushar Deepak; Gopal, Ajei Sarat; Kirby, Orvalle Theodore; Pershing, John Arthur, Jr.; Blount, Marion Lee; Kaplan, Marc Adam; and Turek, John Joseph Edward, 6,016,505, Cl. 709-205.000.
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Turner, William C. Method of manufacturing clad metal plates. 6,015,080, Cl. 228-158.000.
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Zwart, Hans J.; Tyler, Lawrence R.; Palermo, Thomas J.; Bladel, Kevin Van; Young, Roderick A.; and Jervis, James E., 6,015,382, Cl. 600-207.000.
Tymianski, Michael: *See*—
Charlton, Milton P.; and Tymianski, Michael, 6,015,834, Cl. 514-561.000.
Tyson, John A.: *See*—
Dickinson, Alexander George; McPherson, Ross; Mendis, Sunetra; Ross, Paul C.; and Tyson, John A., 6,016,355, Cl. 382-124.000.
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Uchida, Maki: *See*—
Iwasaki, Hiroaki; Watanabe, Yukimasa; Saitoh, Sakae; Matsumoto, Shyunichi; and Uchida, Maki, 6,015,646, Cl. 430-83.000.
Ueda, Hiroyuki: *See*—
Kimura, Atsunori; Ono, Yoichi; Minamishin, Hayato; Tanaka, Yuji; Ohno, Seiichi; Hata, Hidekazu; Ueda, Hiroyuki; Esaki, Isamu; and Uchida, Atsushi, 6,015,147, Cl. 271-163.000.
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Koike, Haruo; Ueda, Yasufumi; Matsuda, Koji; and Kabaki, Mikio, 6,015,921, Cl. 560-36.000.
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Onishi, Katsuhiro; Yamauchi, Kiminori; Tsukada, Hideaki; Ueda, Yukinori; and Masuda, Fumitoshi, 6,016,098, Cl. 338-160.000.
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Setani, Michitaka; and Ueno, Emiko, 6,016,222, Cl. 359-571.000.
Ueno, Hideyuki: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 6,016,162, Cl. 348-405.000.
Ueno, Kazunori: *See*—
Kuribayashi, Masaki; Hashimoto, Yuichi; Senoo, Akihiro; Ueno, Kazunori; and Tsuzuki, Hidetoshi, 6,016,037, Cl. 315-169.300.
Uetani, Yoshiharu: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 6,016,162, Cl. 348-405.000.
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Kanbara, Tetsuro; and Ueyama, Masayuki, 6,016,231, Cl. 359-824.000.
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Ullrich, Axel: *See*—
Hudziak, Robert Michael; Shepard, H. Michael; and Ullrich, Axel, 6,015,567, Cl. 424-277.100.
Ultra Sonus AB: *See*—
Nilsson, Bo; and Dahlberg, Håkan, 6,016,023, Cl. 310-341.000.
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Uni-Charm Corporation: *See*—
Takai, Hisashi; Goda, Hiroki; and Tsuji, Tomoko, 6,015,936, Cl. 604-383.000.
Unicor GmbH Rahn-Plastmaschinen: *See*—
Rahn, Horst, 6,015,282, Cl. 425-233.000.
Unilever, N.V.: *See*—
Reimers, Bruno; Mensing, Joseph; and Holtkamp, Wilhelm, 6,015,581, Cl. 426-282.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
McCullough, James Douglas, Jr., 6,015,854, Cl. 524-396.000.
Union Looper Co., Ltd.: *See*—
Yaw, Larry, 6,014,821, Cl. 36-8.100.
Unipor AG: *See*—
Hirzel, Theodor, 6,015,518, Cl. 264-69.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Bradshaw, Madeline Joan; Jones, John Clifford; Sage, Ian Charles; McDonnell, Damien Gerard; and Gass, Paul Anthony, 6,016,180, Cl. 349-156.000.
United Microelectronics Corporaiton: *See*—
Wen, Jemmy, 6,015,756, Cl. 438-695.000.
United Microelectronics Corp.: *See*—
Chang, Kuang-Yeh, 6,015,995, Cl. 257-390.000.
Chen, Coming; Wu, Juan-Yuan; and Lur, Water, 6,015,755, Cl. 438-692.000.
Huang, Kuo-Feng; Wang, Kuo-Chen; Hsu, Hsien-Jung; and Ma, Hung-Lung, 6,015,096, Cl. 239-73.000.
Lin, Chin-Lung; and Ku, Yao-Ching, 6,016,201, Cl. 356-388.000.
Lin, Tony; Lur, Water; and Sun, Shih-Wei, 6,015,741, Cl. 438-305.000.
Lin, Tony; Tseng, Hua-Chou; and Lur, Water, 6,015,753, Cl. 438-682.000.
Yeh, Wen-Kuan; Lin, Tony; and Huang, Heng-Sheng, 6,015,746, Cl. 438-421.000.
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Lin, Benjamin Szu-Min, 6,015,642, Cl. 430-5.000.
United Parcel Service of America, Inc.: *See*—
Bonnet, Henri, 6,015,039, Cl. 198-368.000.
United Silicon Incorporated: *See*—
Tseng, Chin-Hung, 6,015,744, Cl. 438-401.000.
United States of America
Agriculture: *See*—
Wesley, Ronald D.; Clouser, Deborah F.; Mengeling, William L.; Andreyev, Vladimir G.; Vorwald, Ann C.; and Lager, Kelly M., 6,015,663, Cl. 435-5.000.
Army: *See*—
Duddu, Raja G.; and Dave, Paritosh R., 6,015,898, Cl. 540-554.000.
Commerce: *See*—
Baldarelli, Richard; Branton, Daniel; Church, George; Deamer, David W.; Akeson, Mark; and Kasianowicz, John, 6,015,714, Cl. 436-2.000.
Health and Human Services: *See*—
Boyd, Michael R., 6,015,876, Cl. 530-300.000.
Gonzalez, Frank J.; and Fernandez-Salguero, Pedro, 6,015,673, Cl. 435-6.000.
Navy: *See*—
Aklufi, Monti E.; and Russell, Stephen D., 6,014,944, Cl. 118-723.00R.
Amuro, Stephen J.; and Giorgio, Paul J., 6,016,506, Cl. 709-217.000.
Boss, Pamela A.; and Boss, Roger D., 6,015,479, Cl. 204-412.000.
Burns, William K.; and Moeller, Robert P., 6,016,198, Cl. 356-345.000.
Canaday, Michael M.; and Watson, Fred W., Jr., 6,014,923, Cl. 89-127.000.

Harbison, Barry B.; Sanghera, Jasbinder S.; Shaw, L. Brandon; and Aggarwal, Ishwar D., 6,015,765, Cl. 501-40.000.
Pollock, James S., Jr.; and Cembrola, Joan M., 6,016,453, Cl. 701-21.000.
Ralls, Stephen Alden; and Simonson, Lloyd Grant, 6,015,681, Cl. 435-7.320.
U.S. Philips Corporation: *See*—
De Wit, Johannes; Ettes, Wilhelmus G. M.; Van Der Wal, Roelf; and Botma, Jacob H., 6,016,261, Cl. 363-21.000.
Fuchs, Martin; Rogers, John A.; and Banet, Matthew J., 6,016,202, Cl. 356-432.00T.
Gourrier, Serge; and Hazan, Jean-Pierre, 6,015,234, Cl. 374-164.000.
Grubben, Antonius P. M.; and Van De Meerakker, Jacobus J. M., 6,016,093, Cl. 335-210.000.
Guedes, Yvon; and Sfez, Rémi, 6,016,314, Cl. 370-337.000.
Heeringa, Schelte, 6,016,260, Cl. 363-21.000.
Notten, Petrus H.L.; Bergveld, Hendrik J.; and Kruijt, Wanda S., 6,016,047, Cl. 320-137.000.
Wielstra, Ytsen, 6,015,623, Cl. 428-447.000.
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Savino, John E.; Gallagher, Thomas P.; Macy, Barbara Reid; Scully, Michael John; Toney, Elizabeth D.; Harlow, Ernest R.; and Naglieri, James W., 6,015,167, Cl. 283-67.000.
Violette, John A.; Soule, Matthew C.; and Corley, Thomas G., 6,015,264, Cl. 416-146.00A.
United Video Properties, Inc.: *See*—
Knudson, Edward B.; Ellis, Michael D.; Thomas, William L.; and Davis, Bruce L., 6,016,141, Cl. 345-327.000.
University of Akron, The: *See*—
Fenkanyn, John M.; and Hartley, Tom T., 6,015,296, Cl. 434-301.000.
University of Arkansas, The Board of Trustees of the: *See*—
Heikes, David L., 6,015,049, Cl. 209-675.000.
University of California, The Regents of the: *See*—
Baldarelli, Richard; Branton, Daniel; Church, George; Deamer, David W.; Akeson, Mark; and Kasianowicz, John, 6,015,714, Cl. 436-2.000.
Bowers, John E.; and Tauber, Daniel Abraham, 6,015,980, Cl. 257-99.000.
Keller, Christopher G.; and Ferrari, Mauro, 6,015,599, Cl. 428-34.400.
Lipkin, W. Ian; Briese, Thomas; Kliche, Stefanie; Schneider, Patrick A.; Stitz, Lothar; and Schneemann, Anette, 6,015,660, Cl. 435-5.000.
Nathel, Howard; Cartland, Harry E.; Colston, Billy W., Jr.; Everett, Matthew J.; and Roe, Jeffery N., 6,015,969, Cl. 250-227.270.
Petersen, Carolyn; Leech, James; Nelson, Richard C.; and Gut, Jiri, 6,015,882, Cl. 530-350.000.
Siverling, Todd D.; Chroninger, William Anthony; Chroninger, William Andrew; Gauss, Kreg T.; and Radzinski, William S., 6,015,494, Cl. 210-299.000.
Welch, William J.; and Hegde, Ramanujan, 6,015,659, Cl. 435-1.200.
University of Connecticut: *See*—
Lostritto, Richard T., Jr.; and Groeger, Joseph H., 6,015,777, Cl. 508-208.000.
Padture, Nitin P.; Gell, Maurice; and Klemens, Paul G., 6,015,630, Cl. 428-632.000.
University of Georgia Research Foundation, Inc.: *See*—
Pierce, James Michael; Shoreibah, Mohamed G.; Adler, Beverly; and Fregien, Nevis Lee, 6,015,701, Cl. 435-193.000.
University of Illinois, The Board of Trustees of the: *See*—
DeTemple, Thomas A.; Frame, James; Wheeler, David J.; and Eden, J. Gary, 6,016,027, Cl. 313-356.000.
University of Kentucky Research Foundation: *See*—
Ain, Kenneth Bruce; and Venkataraman, Gopalakrishnan, 6,015,376, Cl. 586-23.100.
University of Michigan, The Regents of the: *See*—
Baker, James R., Jr.; Wright, D. Craig; Hayes, Michael M.; Hamouda, Tarek; and Brisker, Joan, 6,015,832, Cl. 514-546.000.
Dixit, Vishva M., 6,015,665, Cl. 435-6.000.
Kaminski, Mark S.; Butchko, Gregory M.; Glenn, Stephan D.; and Wahl, Richard L., 6,015,542, Cl. 424-1.490.
University of Minnesota, The Regents of the: *See*—
Miller, Bradley N.; Konstan, Joseph A.; and Riedl, John T., 6,016,475, Cl. 705-1.000.
University of Mississippi Medical Center, The: *See*—
Piletz, John E.; and Ivanov, Tina R., 6,015,690, Cl. 435-69.100.
University of Nebraska, Board of Regents of the: *See*—
Noureddini, Hossein, 6,015,440, Cl. 44-388.000.
University of North Carolina at Chapel Hill, The: *See*—
Cance, William G.; Liu, Edison T.; and Owens, Lewis V., 6,015,893, Cl. 536-24.500.
University of Pittsburgh: *See*—
Antaki, James F.; Paden, Bradley; Burgreen, Gregory; and Groom, Nelson, 6,015,272, Cl. 417-356.000.
University of Rochester: *See*—
Golub, Lorne M.; Ritchlin, Christopher T.; Greenwald, Robert A.; Haas-Smith, Sally; Moak, Susan A.; and Lee, Hsi-Ming, 6,015,804, Cl. 514-152.000.
University of Sheffield: *See*—
Heath, Paul Roy; Orange, Paul Richard; Pearson, Ronald Carl Alan; and Wright, Simon Ralph, 6,015,888, Cl. 536-23.500.
University of Tennessee Research Corporation, The: *See*—
Hopkins, John A.; Schwartz, Frederick A.; McCay, Mary Helen; McCay, Thurman Dwayne; Dahotre, Narendra B.; and Bible, John Brice, 6,016,227, Cl. 359-668.000.
University of Texas System, The: *See*—
Shay, Jerry W.; Wright, Woodring E.; Piatyszek, Mieczyslaw A.; Corey, David R.; and Norton, James C., 6,015,710, Cl. 435-375.000.
University of Texas System, The Board of Regents of the: *See*—
Olson, Eric N.; Li, Li; and Miano, Joseph M., 6,015,711, Cl. 435-375.000.
University of Washington, The: *See*—
Rose, Timothy M.; Bosch, Marnix L.; and Strand, Kurt, 6,015,565, Cl. 424-229.100.
University of Washington, The Board of Regents of the: *See*—
Beavo, Joseph A.; Bentley, Kelley J.; Charbonneau, Harry; and Sonnenburg, William K., 6,015,677, Cl. 435-6.000.
University Technologies International Inc.: *See*—
Pon, Richard T.; and Yu, Shuyuan, 6,015,895, Cl. 536-25.300.
Uno, Kinji: *See*—
Yamauchi, Yasuji; Yamanaka, Toshio; Okumura, Masafumi; Hirai, Masashi; Taka, Kyousuke; Uno, Kinji; Yoneda, Yoshiharu; and Yamauchi, Hirokazu, 6,014,920, Cl. 83-560.000.
UOP LLC: *See*—
Abrevaya, Hayim; and Vora, Bipin V., 6,015,933, Cl. 585-810.000.
Frey, Stanley J., 6,015,932, Cl. 585-751.000.
Upton, Adrian R. M.: *See*—
Fischell, Robert E.; Fischell, David R.; and Upton, Adrian R. M., 6,016,449, Cl. 607-45.000.
Urabe, Tetsuo: *See*—
Kataoka, Hideo; Shigeno, Nobuyuki; Munakata, Masaki; and Urabe, Tetsuo, 6,016,178, Cl. 349-117.000.
Urakawa, Toshio, to Sharp Kabushiki Kaisha. Image forming apparatus. 6,016,156, Cl. 347-134.000.
Urata, Kazuya; Yoshimi, Naoto; Kubota, Takahiro; Yamashita, Masaaki; and Haruta, Yasuhiko, to NKK Corporation. Organic composite coated steel sheet with good press formability and perforation corrosion resistance. 6,015,628, Cl. 428-623.000.
Urazono, Takenobu: *See*—
Minegishi, Masahiro; Ino, Masumitsu; Kunii, Masafumi; Urazono, Takenobu; and Hayashi, Hisao, 6,015,720, Cl. 438-30.000.
UroMetrics, Inc.: *See*—
Hovland, Claire T.; Dixon, Roger; Knoll, L. Dean; and Abrams, Jerome H., 6,015,393, Cl. 600-587.000.
Ushirono, Junichi: *See*—
Fukumoto, Hirohide; Ushirono, Junichi; Nakano, Minoru; and Kataoka, Hideo, 6,016,179, Cl. 349-128.000.
Utagawa, Takashi: *See*—
Mihara, Yasuhiro; Utagawa, Takashi; Yamada, Hideaki; and Asano, Yasuhisa, 6,015,697, Cl. 435-87.000.
Uto, Yoshitsugu, to Barudan Sewing Machine Co., LTD. Over edging apparatus for single cloth piece products. 6,014,938, Cl. 112-470.180.
Utsumi, Ichiro: *See*—
Iguchi, Yukinobu; Utsumi, Ichiro; and Saita, Koji, 6,016,028, Cl. 313-402.000.
Uwano, Takashi: *See*—
Tsuji, Kouichi; Yoshida, Yoshihiro; and Uwano, Takashi, 6,015,680, Cl. 435-7.230.
Uzawa, Tsutomu, to Olympus Optical Co. Ltd. Zoom lens system. 6,016,228, Cl. 359-687.000.
V.I.V. International S.P.A.: *See*—
Fenzi, Giancarlo, 6,015,469, Cl. 156-230.000.
Vaidyanathan, Mohan: *See*—
Meyer, Ronald K., Jr.; Vaidyanathan, Mohan; Pekny, William; Griffith, Gerald P.; and Mui, Peter H., 6,016,214, Cl. 359-237.000.
Vail III, William Banning. Determination of gravity by observation of density variations in gases. 6,014,895, Cl. 73-382.00R.
Valence Technology, Inc.: *See*—
Gao, Feng; Barker, Jeremy; and Liu, Peikang, 6,015,639, Cl. 429-307.000.
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Ponziani, Richard L., 6,015,276, Cl. 417-423.140.
Valeo Vision: *See*—
Blusseau, Eric, 6,015,220, Cl. 362-303.000.
Valunin, Igor; and Rozakis, George W., to International Vision, Inc. Self-centering phakic intraocular lens. 6,015,435, Cl. 623-6.000.
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Van Bemmel, Peter P.: *See*—
Klebba, Eric F.; and Van Bemmel, Peter P., 6,016,287, Cl. 367-72.000.
VanBuskirk, Ronald: *See*—
Fado, Frank; Guasti, Peter; Nassiff, Amado; and VanBuskirk, Ronald, 6,016,136, Cl. 345-133.000.
Van De Meerakker, Jacobus J. M.: *See*—
Grubben, Antonius P. M.; and Van De Meerakker, Jacobus J. M., 6,016,093, Cl. 335-210.000.
Van Den Berg, Keimpe Jan: *See*—
Koenraadt, Martinus Adrianus Anthonius Maria; Noomen, Arie; Van Den Berg, Keimpe Jan; Van Oorschot, Josephus Christiaan; and Klinkenberg, Huig, 6,015,864, Cl. 525-385.000.
Vandenboom, Robert M.; Poole, David L.; Steinbrunner, Steven L.; and Seffernick, Lewis L., to CTS Corporation. Z-axis resistor test system. 6,014,900, Cl. 73-781.000.
van den Hurk, Jan; and Tijssen, Peter, to Biostar, Inc. Bovine viral diarrhea virus II vaccine and method of immunization. 6,015,795, Cl. 514-44.000.
VanderLende, Daniel D.: *See*—

Nickias, Peter N.; McAdon, Mark H.; Patton, Jasson T.; Friedrichsen, Bernard P.; Soto, Jorge; Stevens, James C.; and VanderLende, Daniel D., 6,015,868, Cl. 526-127.000.

Vander Meer, Brett. Self locking forklift attachment. 6,015,255, Cl. 414-607.000.

Van Der Wal, Roelf: *See*—
De Wit, Johannes; Ettes, Wilhelmus G. M.; Van Der Wal, Roelf; and Botma, Jacob H., 6,016,261, Cl. 363-21.000.

Van Erden, Donald L.: *See*—
McMahon, Michael J.; Van Erden, Donald L.; Kobetsky, Robert G.; Malin, Art; and Machacek, Zdenek, 6,014,795, Cl. 24-400.000.

Van Goethem, Luc: *See*—
Janssens, Robert; Heirbaut, Werner; Van Goethem, Luc; Baeyens, Peter; and Trouillard, Frank, 6,016,420, Cl. 399-397.000.

Vanguard International Semiconductor Corporation: *See*—
Chi, Min-Hwa, 6,016,279, Cl. 365-203.000.
Lin, Ming-Zen, 6,016,264, Cl. 365-96.000.
Ternullo, Luigi, Jr.; and Stephens, Michael C., 6,016,072, Cl. 327-535.000.

Van Helleputte, Henri Roger Jules Richard: *See*—
Buzak, Thomas S.; Ilcisin, Kevin J.; Martin, Paul C.; Den Biggelaar, Hans J. G. A.; Bruinink, Jacob; Bongaerts, Petrus Franciscus Gerardus; Burgmans, Adrianus Leonardus Josephus; Khan, Babar Ali; and Van Helleputte, Henri Roger Jules Richard, 6,016,032, Cl. 313-493.000.

Van Oorschot, Josephus Christiaan: *See*—
Koenraadt, Martinus Adrianus Anthonius Maria; Noomen, Arie; Van Den Berg, Keimpe Jan; Van Oorschot, Josephus Christiaan; and Klinkenberg, Huig, 6,015,864, Cl. 525-385.000.

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Vansant, Jan L.: *See*—
Greuel, Walter J., Jr.; Pieslak, George; Renteria, Efrain; Simpson, Stanley; Vansant, Jan L.; and Wallace, Barnie A., Jr., 6,015,600, Cl. 428-34.900.

VanTassel, Robert A.: *See*—
Schwartz, Robert S.; VanTassel, Robert A.; and Holmes, David R., 6,015,387, Cl. 600-504.000.
Schwartz, Robert S.; Holmes, David R.; and VanTassel, Robert A., 6,015,405, Cl. 606-16.000.

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Varnado, Albert D. Pool cover system. 6,014,778, Cl. 4-502.000.

Vatterott, Pierce: *See*—
Juran, Carleen J.; Yakimow, Kristin; Shelton, Michael B.; Stroebel, John C.; Markowitz, H. Toby; Vatterott, Pierce; and Strandquist, Harry A., 6,016,447, Cl. 607-27.000.

Vaughn, Gary, to CTS Corporation. Pulse frequency modulation drive circuit for piezoelectric transformer. 6,016,052, Cl. 323-355.000.

Veeraraghavan, Malathi: *See*—
Kshirsagar, Madhukar M.; La Porta, Thomas F.; Shur, David H.; Veeraraghavan, Malathi; and Woodworth, Clark, 6,016,319, Cl. 370-410.000.

Vehicular Technologies, Inc.: *See*—
Tyson, Mark V., 6,014,916, Cl. 74-650.000.

Venable, Robert J: *See*—
Failing, Bruce F, Jr.; Fernandez, Anthony P; Briechle, George T; Fenwick, Edward J; and Venable, Robert J, 6,016,481, Cl. 705-28.000.

Venkataraman, Gopalakrishnan: *See*—
Ain, Kenneth Bruce; and Venkataraman, Gopalakrishnan, 6,015,376, Cl. 586-23.100.

Ventura, Luciano: *See*—
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Egging, Philip J.; Bartels, Brent A.; and Kappel, Gary W., 6,014,996, Cl. 144-334.000.

Vessella, Patrick: *See*—
Tachon, Michel; and Vessella, Patrick, 6,014,989, Cl. 139-88.000.

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Benedetti, Pier Alberto; Evangelista, Valtere; Guidarini, Dante; and Vestri, Stefano, 6,016,367, Cl. 382-275.000.

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Yamagishi, Toru; Miyazaki, Ken; and Yokouchi, Kentaro, 6,016,382, Cl. 386-109.000.

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Bonilla, Nelson; and Vigorito, Thomas J., 6,015,303, Cl. 439-107.000.

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Castillo, Richard; Nair, Ravinder; Srinivasan, Krishna; and Villela, Edward C., 6,015,343, Cl. 454-365.000.

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Cuny, Christian; and Vincent, Alain, 6,016,378, Cl. 385-135.000.

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Sanchez, Ivan; Echtle, Danny; and Vines, Landon B., 6,016,001, Cl. 257-530.000.

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Jaramillo, Ken; and Spaniol, David Gerard, 6,016,528, Cl. 710-243.000.
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Williamson, Jon Roderick; and Nariani, Subhash R., 6,015,732, Cl. 438-253.000.

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Seifert, Dean Alan; Stoutenburg, Earney; and Vogt, Paul J., 6,015,087, Cl. 235-379.000.

Voisine, John T.: *See*—
Slater, Byron J.; Voisine, John T.; and Dykstal, Gregory L., 6,016,054, Cl. 324-142.000.

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McKeehan, Michael D.; and Voldal, Erik E., 6,016,495, Cl. 707-103.000.

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Cullman, Elmar; Völkel, Reinhard; and Wells, Karin M., 6,016,185, Cl. 355-52.000.

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Dornberger, Erich; and Von Ammon, Wilfried, 6,015,460, Cl. 117-217.000.

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Cao, Min; Theil, Jeremy A; Ray, Gary W; and Vook, Dietrich W, 6,016,011, Cl. 257-773.000.

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Abrevaya, Hayim; and Vora, Bipin V., 6,015,933, Cl. 585-810.000.

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Wesley, Ronald D.; Clouser, Deborah F.; Mengeling, William L.; Andreyev, Vladimir G.; Vorwald, Ann C.; and Lager, Kelly M., 6,015,663, Cl. 435-5.000.

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Chen, Julian Zhiliang; Vrotsos, Thomas A.; and Chen, Wayne T., 6,016,002, Cl. 257-546.000.

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Buttgen, Heinz; Burger, Konrad; Callenbach, Tilo; Mazenauer, Karl; Riesen, Daniel; and Vuille, Daniel, 6,015,396, Cl. 604-192.000.

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Krämer, Wolfgang; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Turberg, Andreas; and Mencke, Norbert, 6,015,823, Cl. 514-374.000.

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Dornberger, Erich; and Von Ammon, Wilfried, 6,015,460, Cl. 117-217.000.

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Hiyama, Hirokuni; and Wada, Yutaka, 6,015,337, Cl. 451-288.000.

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Arnold, John K.; Bennett, John R.; Claar, Peter O.; Dahl, Kurt D.; Dobson, Jennifer L.; Fontaine, Charles A.; Johanson, Philip H.; McGuire, Donald G.; Swanson, Mary; Wagner, David G.; and Wainright, Steve, 6,016,504, Cl. 709-200.000.

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Buhler, Joe P.; Butt, David; Goll, Jeffrey H.; Wagner, Neldon C.; and Whitney, Hartwell H., 6,015,383, Cl. 600-437.000.

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Kaminski, Mark S.; Butchko, Gregory M.; Glenn, Stephan D.; and Wahl, Richard L., 6,015,542, Cl. 424-1.490.

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Arnold, John K.; Bennett, John R.; Claar, Peter O.; Dahl, Kurt D.; Dobson, Jennifer L.; Fontaine, Charles A.; Johanson, Philip H.; McGuire, Donald G.; Swanson, Mary; Wagner, David G.; and Wainright, Steve, 6,016,504, Cl. 709-200.000.

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Kubotsu, Kazuhisa; Yamamoto, Sachiko; and Kida, Masaaki, 6,015,679, Cl. 435-7.100.

Walch, Hatto, to Rodleben Pharma GmbH. Trapidil for use in the therapy of syndrome that may be influenced by immunomodulators. 6,015,578, Cl. 424-464.000.

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Stoll, Kurt; Mödinger, Uwe; and Waldmann, Dieter, 6,014,924, Cl. 92-13.500.

Waldo, James H.; Wollrath, Ann M.; Scheifler, Robert; and Arnold, Kenneth C.R.C., to Sun Microsystems, Inc. Leasing for failure detection. 6,016,500, Cl. 707-202.000.

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Saxton, Catherine J.; Saxton, Thomas W.; and Walker, Mark John, 6,016,492, Cl. 707-100.000.

Wall, William H. Expandable stent having a fabric liner. 6,015,430, Cl. 623-1.000.

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Greff, Richard J.; and Wallace, George, 6,015,541, Cl. 424-1.250.

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Heyer, Thomas J. D.; Wandmacher, Robert A.; Chor, Lawrence C.; and Larson, John T., 6,015,629, Cl. 428-625.000.

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Craig, Alan Robert; Reidy, Michael Patrick; and Wang, Chengrong, 6,015,480, Cl. 204-418.000.

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Wang, Zhe; Almstead, Neil Gregory; Bradley, Rimma Sandler; Natchus, Michael George; De, Biswanath; Pikul, Stanislaw; and Taiwo, Yetunde Olabisi, to Procter & Gamble Company, The. Spirocyclic containing hydroxamic acids useful as metalloprotease inhibitors. 6,015,912, Cl. 548-408.000.

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Fortune, G. Clark; Waraksa, Thomas J.; Spring, James K.; and Prainito, John D., 6,016,102, Cl. 340-442.000.

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Orloff, Glennis J., 6,014,918, Cl. 83-13.000.

Warner-Lambert Company: *See*—
Nikam, Sham Shridhar, 6,015,800, Cl. 514-85.000.

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Wasileski, John Marion: *See*—
Jacobson, Gunnard Kenneth; Jolly, Setsuko Omata; Sedmak, Joseph James; Skatrud, Thomas Joseph; and Wasileski, John Marion, 6,015,684, Cl. 435-67.000.

Watanabe, Akira: *See*—
Miwa, Takao; Watanabe, Akira; Ito, Osamu; and Matsuda, Minoru, 6,015,596, Cl. 427-489.000.

Watanabe, Kaoru: *See*—
Yano, Toshiyuki; Kojima, Hitoshi; Hiraoka, Eisuke; Chujo, Akihiko; Watanabe, Kaoru; Nagai, Hiromi; Endo, Yasuharu; and Hashimoto, Ken, 6,015,455, Cl. 106-31.580.

Watanabe, Kazushi: *See*—
Yokoyama, Katsunori; Watanabe, Kazushi; and Numagami, Atsushi, 6,016,413, Cl. 399-113.000.

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Watanabe, Masaru: *See*—
Mifune, Tatsuo; Sakamoto, Kazunori; Ohata, Tsumoru; and Watanabe, Masaru, 6,015,592, Cl. 427-376.200.

Watanabe, Takemi: *See*—
Okamura, Yuichi; Hosokawa, Junichi; and Watanabe, Takemi, 6,016,188, Cl. 355-89.000.

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Goto, Shinji; Saito, Jun; Ishii, Hiroyuki; Ando, Masao; Watanabe, Yoshiaki; Isoda, Yuzo; Tanoue, Masahide; and Inoue, Ryukichi, 6,016,412, Cl. 399-111.000.

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Watanabe, Yukimasa: *See*—

Iwasaki, Hiroaki; Watanabe, Yukimasa; Saitoh, Sakae; Matsumoto, Shyunichi; and Uchida, Maki, 6,015,646, Cl. 430-83.000.

Waters, Keith: *See—*
Kang, Sing Bing; and Waters, Keith, 6,016,148, Cl. 345-425.000.

Watson, Fred W., Jr.: *See—*
Canaday, Michael M.; and Watson, Fred W., Jr., 6,014,923, Cl. 89-127.000.

Watson, George Patrick: *See—*
Cirelli, Raymond Andrew; Mkrtchyan, Masis; Trimble, Lee Edward; Watson, George Patrick; and Windt, David Lee, 6,015,644, Cl. 430-30.000.

Watts, Michael: *See—*
Kafka, James; Newell, Vincent J.; Watts, Michael; and Clark, James, 6,016,323, Cl. 372-20.000.

WAVTrace, Inc.: *See—*
Foster, Robert B., Jr.; Baugh, Charles R.; and Schafer, David C., 6,016,313, Cl. 370-330.000.

Weatherford US Holding, L.P. a Louisiana Limited Partnership: *See—*
Umphries, Donald V.; Owen, Harold D.; Ford, Bobby R.; and Wesson, David S., 6,014,933, Cl. 102-312.000.

Weber, Herbert. Anchor for guard rail system on structural grating floors. 6,015,139, Cl. 256-65.000.

Weber, Ronald G.: *See—*
Mertzel, Elaine A.; Weber, Ronald G.; and Citarel, Louis, 6,015,861, Cl. 525-232.000.

Weber, Walter. Device for mounting a hydraulically operated tailgate on a truck. 6,015,179, Cl. 296-57.100.

Webinger, George: *See—*
Sandberg, Thomas Michael; and Webinger, George, 6,015,043, Cl. 206-446.000.

Webster, Craig, to Black & Decker, Inc. Battery powered vegetation trimmer. 6,014,812, Cl. 30-276.000.

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Buttgen, Heinz; Burger, Konrad; Callenbach, Tilo; Mazenauer, Karl; Riesen, Daniel; and Vuille, Daniel, 6,015,396, Cl. 604-192.000.

Weidmann, Klaus: *See—*
Brendel, Joachim; Gerlach, Uwe; Lang, Hans Jochen; and Weidmann, Klaus, 6,015,822, Cl. 514-357.000.

Weigand, Peter: *See—*
Tobben, Dirk; and Weigand, Peter, 6,015,988, Cl. 257-308.000.

Weigelt, Oliver: *See—*
Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Martin, Varenka; Weigelt, Oliver; Winckel, Laurent; and Yoshida, Satoshi, 6,016,331, Cl. 375-371.000.

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Weissert, Ulrich; Goenueldinc, Okan; Cercone, Marco; Winslow, Ross; Wolf, Andy; Koehr, Robert; and Heyll, Rolf, to Porsche Engineering Services. Vehicle door structures incorporating hydroformed elements and processes for assembling such elements. 6,015,182, Cl. 296-146.600.

Weist, Udo: *See—*
Schenk, Jürgen; Weist, Udo; Welter, Lothar; and Wolf, Hans-Christoph, 6,014,860, Cl. 60-286.000.

Wekel, Hans-Ulrich: *See—*
Schade, Christian; Wekel, Hans-Ulrich; Sanner, Axel; and Sperling, Karin, 6,015,551, Cl. 424-78.080.

Welch Allyn, Inc.: *See—*
Parker, James A.; and Ehrhart, Michael A., 6,015,088, Cl. 235-462.010.

Welch, Michael D.: *See—*
Merry, Walter Richardson; Brown, William; Herchen, Harald; and Welch, Michael D., 6,015,761, Cl. 438-727.000.

Welch, Randall Scott; and Obermeyer, Richard, to Pacific Micro Data, Inc. Module mounting system. 6,015,196, Cl. 312-223.200.

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Wells, Joseph Warreb: *See—*
Kephart, Jeffrey Owen; Morin, Alexandre Guy Georges; Sorkin, Gregory Bret; and Wells, Joseph Warreb, 6,016,546, Cl. 713-200.000.

Wells, Karin M.: *See—*
Cullman, Elmar; Völkel, Reinhard; and Wells, Karin M., 6,016,185, Cl. 355-52.000.

Wells, Raymond, to Storm Diverter Corporation. Wind directing sea wall. 6,015,244, Cl. 405-22.000.

Welter, Lothar: *See—*
Schenk, Jürgen; Weist, Udo; Welter, Lothar; and Wolf, Hans-Christoph, 6,014,860, Cl. 60-286.000.

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Wend, Charles Albert. Folding hunting seat. 6,015,190, Cl. 297-378.100.

Wenger SA: *See—*
Cachot, Maurice, 6,014,786, Cl. 7-118.000.

Wenker, Paul Andrew: *See—*
Jargon, Jonathan David; Wenker, Paul Andrew; Fernalld, Kenneth Hudson; Bodmer, James Harold; and Paquet, David William, 6,016,240, Cl. 360-105.000.

Wenzl, Peter P.: *See—*
Fisher, Mark Robert; DeBraal, John Charles; Steffan, Guido; and Wenzl, Peter P., 6,015,771, Cl. 503-209.000.

Werner, Dietrich: *See—*
Schmidt, Hans Werner; Rahn, Martin; Stockhausen, Werner; Werner, Dietrich; and Hirsch, Martin, 6,015,539, Cl. 423-625.000.

Werp, Peter R.; Blume, Walter M.; Creighton, Francis M., IV; and Ritter, Rogers C., to Stereotaxis, Inc. Method and apparatus for magnetically controlling motion direction of a mechanically pushed catheter. 6,015,414, Cl. 606-108.000.

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Wessolly, Bernd: *See—*
Scholz, Werner; Bachnick, Werner; Streckenbach, Wulf-Christian; Wessolly, Bernd; Voessing, Walter; Peters, Hartmut; Schroeder, Ernst F.; Timmermann, Friedrich; Meunier, Paul-Louis; and Artigalas, Max, 6,016,233, Cl. 360-15.000.

Wesson, David S.: *See—*
Umphries, Donald V.; Owen, Harold D.; Ford, Bobby R.; and Wesson, David S., 6,014,933, Cl. 102-312.000.

West, Roderick Michael Peters: *See—*
Evans, Edward Kelley; Long, Andrew Anthony; and West, Roderick Michael Peters, 6,016,137, Cl. 345-145.000.

West, William: *See—*
Robinson, Alan David; and West, William, 6,016,458, Cl. 701-93.000.

Westfalia Separator AG: *See—*
Moss, Reinhard, 6,015,375, Cl. 494-27.000.

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Jones, Charlie E.; Kazakis, Michael V.; and Dossaji, Murtaza R., 6,014,820, Cl. 34-548.000.

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Peterson, Ralph Scott, 6,015,044, Cl. 206-460.000.

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Gluchowski, Charles; Forray, Carlos C.; Chiu, George; Branchek, Theresa A.; Wetzel, John M.; and Hartig, Paul R., 6,015,819, Cl. 514-318.000.

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Marelin, Miklos; Mossbrucker, Mark; Hinnen, Hans R.; and Whalen, John E., Jr., 6,014,792, Cl. 24-20.00R.

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Baughman, James; and Wheeler, Douglas J., 6,016,049, Cl. 320-167.000.

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Arell, Thomas William, 6,016,076, Cl. 330-149.000.
Benjamin, Karen Elizabeth; and Consoli, John Joseph, 6,015,311, Cl. 439-267.000.
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Davis, Wayne Samuel; Whiteman, Robert Neil, Jr.; and Leaman, Christopher Scott, 6,015,313, Cl. 439-419.000.
Whitney, Hartwell H.: *See*—
Buhler, Joe P.; Butt, David; Goll, Jeffrey H.; Wagner, Neldon C.; and Whitney, Hartwell H., 6,015,383, Cl. 600-437.000.
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Bell, Andrew Simon; Fray, Michael Jonathan; Marchington, Alan Patrick; Richardson, Kenneth; Stephenson, Peter Thomas; and Whittle, Peter John, 6,015,825, Cl. 514-383.000.
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Maly, Neil Arthur; Wideman, Lawson Gibson; and Lukich, Lewis Timothy, 6,015,851, Cl. 524-243.000.
Wiechers, Bernhard: *See*—
Jahn, Dieter; and Wiechers, Bernhard, 6,014,825, Cl. 37-91.000.
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Wilde, Graham: *See*—
Luft, H. Bernie; Wilde, Graham; and Pelensky, Peter J., 6,015,015, Cl. 166-384.000.
Wilkerson, Larry Allen: *See*—
Roslund, Richard N., Jr.; Nelson, Patrick; Wilkerson, Larry Allen; Roark, Troy; Dral, Joel; Simpson, Steve; and Clark, John, 6,015,187, Cl. 297-300.400.
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White, David Baker; and Williams, Darryl, 6,015,322, Cl. 445-7.000.
Williams, Derek Edward: *See*—
Arimilli, Ravi Kumar; and Williams, Derek Edward, 6,016,526, Cl. 710-105.000.
Williams, Donald J., to 3M Innovative Properties Company. Ink-receptive sheet. 6,015,624, Cl. 428-500.000.
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Williams, Kevin J.: *See*—
Ross, David J.; Isaacs, Blake L.; and Williams, Kevin J., 6,016,423, Cl. 455-90.000.
Williams, Richard A., to Matrix Master Inc. Vibration input to moving aqueous cementitious slurry. 6,015,225, Cl. 366-6.000.
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Williamson, Cory R.: *See*—
Clem, William E.; Williamson, Cory R.; and Albini, Martin, 6,015,368, Cl. 482-54.000.
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Vinson, Phillip Kyle; Foley, Peter Robert; Cripe, Thomas Anthony; Connor, Daniel Stedman; and Willman, Kenneth William, 6,015,781, Cl. 510-302.000.
Wilson, Nick; and Thibideau, Frank, to Morrison Timing Screw Company. Light box for counter or wall display. 6,014,829, Cl. 40-753.000.
Wilson, Rodney: *See*—
Lasko, William E.; Zwakenberg, Ralph; and Wilson, Rodney, 6,015,265, Cl. 416-247.00R.
Wilz, David M.: *See*—
Rockstein, George B.; Wilz, David M.; Colavito, Stephen J.; German, Gene; and Knowles, Carl Harry, 6,015,091, Cl. 235-472.010.
Winbond Electronics Corp.: *See*—
Chou, Kuo-Yu, 6,015,728, Cl. 438-238.000.
Leu, Len-Yi, 6,015,984, Cl. 257-298.000.
Winckel, Laurent: *See*—
Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Martin, Varenka; Weigelt, Oliver; Winckel, Laurent; and Yoshida, Satoshi, 6,016,331, Cl. 375-371.000.
Windmill Kabushiki Kaisha: *See*—
Maruyama, Susumu, 6,015,286, Cl. 431-130.000.
Windt, David Lee: *See*—
Cirelli, Raymond Andrew; Mkrtchyan, Masis; Trimble, Lee Edward; Watson, George Patrick; and Windt, David Lee, 6,015,644, Cl. 430-30.000.
Winiecki, Jerry R.: *See*—
Henderson, Corbett D.; and Winiecki, Jerry R., 6,015,373, Cl. 493-196.000.
Winks, John Raymond, Jr. Natal zodiac chart. 6,015,295, Cl. 434-106.000.
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Engel, Gary Lowell; Farid, Nagy Alphonse; Faul, Margaret Mary; Jirousek, Michael Robert; Richardson, Lori Ann; and Winneroski, Leonard Larry, Jr., 6,015,807, Cl. 514-183.000.
Winslow, Ross: *See*—
Weissert, Ulrich; Goenueldinc, Okan; Cercone, Marco; Winslow, Ross; Wolf, Andy; Koehr, Robert; and Heyll, Rolf, 6,015,182, Cl. 296-146.600.
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Schaeffer, James Robert; Mauck, John Charles; Winterkorn, Robert Francis; and Arter, Thomas Charles, 6,015,683, Cl. 435-24.000.
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Weiss, Anthony J.; Karmi, Yair; Zorman, Ilan; and Harel, Haim, 6,016,421, Cl. 455-63.000.
Wirostko, Emil. Antibiotic treatment of age-related macular degeneration. 6,015,803, Cl. 514-152.000.
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Wickham, Michael G.; and Wisseman, Philip H., 6,016,371, Cl. 385-10.000.
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Chang, Shun-Hwa; Paiva, Joseph V. R.; and Withington, Alan Henry, 6,016,142, Cl. 345-334.000.
Wohlert, David: *See*—
Kraimer, Amy L.; Pockat, Gregory; and Wohlert, David, 6,015,235, Cl. 383-109.000.
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Jamasbi, Homayoun; Wohltmann, Kenneth Everett; and Spanier, Joseph John, 6,015,871, Cl. 528-48.000.
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Wolf, Andy: *See*—
Weissert, Ulrich; Goenueldinc, Okan; Cercone, Marco; Winslow, Ross; Wolf, Andy; Koehr, Robert; and Heyll, Rolf, 6,015,182, Cl. 296-146.600.
Wolf, Hans-Christoph: *See*—
Schenk, Jürgen; Weist, Udo; Welter, Lothar; and Wolf, Hans-Christoph, 6,014,860, Cl. 60-286.000.
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Kasprzyk, Marlon Zbigniew; and Wolfe, Paul K., 6,016,557, Cl. 714-38.000.
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Seitz, Georg; Lach, Joachim; Klein, Ernst-Ludwig; Wolfschläger, Roland; and Sachs, Ekkehard, 6,016,253, Cl. 361-735.000.
Wollmann, Udo: *See*—
Dötzel, Wolfram; Gessner, Thomas; Hahn, Ramon; Kaufmann, Christian; Löwe, Heinz-Ulrich; Markert, Joachim; Rauch, Manfred; and Wollmann, Udo, 6,016,217, Cl. 359-292.000.
Wollrath, Ann M.: *See*—
Waldo, James H.; Wollrath, Ann M.; Scheifler, Robert; and Arnold, Kenneth C.R.C., 6,016,500, Cl. 707-202.000.
Wong, Emile: *See*—
Maitre, Jean-Paul; Mentech, Julio; Reynaud, Sylvie; and Wong, Emile, 6,015,466, Cl. 127-30.000.
Wong, Po C.: *See*—
Lee, Jack Y. B.; and Wong, Po C., 6,016,552, Cl. 714-6.000.
Wong, Victor L.: *See*—
McCarty, Jon G.; Wong, Victor L.; and Wood, Bernard J., 6,015,285, Cl. 431-7.000.
Wong, Wing-Tak Kenneth: *See*—
Freeman, Daniel Kenneth; Wong, Wing-Tak Kenneth; and Davis, Andrew Gordon, 6,016,468, Cl. 704-220.000.
Wood, Alan G.: *See*—
Akram, Salman; Farnworth, Warren M.; Wood, Alan G.; and Hembree, David R., 6,016,060, Cl. 324-757.000.
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McCarty, Jon G.; Wong, Victor L.; and Wood, Bernard J., 6,015,285, Cl. 431-7.000.
Wood, Eric: *See*—

Blonstein, Steve; Chaney, Jack; Gillespie, Donald; and Wood, Eric, 6,016,144, Cl. 345-342.000.

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Brookes, Graham Robert; Clare, David Andrew; Green, Phillip James; Smith, Richard John; and Woodhouse, Richard Graham, 6,015,155, Cl. 280-5.505.

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Shaw, George H. J.; and Woodruff, Bryan A., 6,016,515, Cl. 709-301.000.

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Kshirsagar, Madhukar M.; La Porta, Thomas F.; Shur, David H.; Veeraraghavan, Malathi; and Woodworth, Clark, 6,016,319, Cl. 370-410.000.

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Fein, Harry; and Liu, Su-Yi, 6,016,372, Cl. 385-12.000.

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Chou, Yueh-Lin, 6,015,641, Cl. 430-5.000.

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Jimenez, Juan M.; Worley, A. Justine; Dodge, Charles W.; and Tribolet, David C., 6,015,143, Cl. 271-4.100.

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Ritchie, David John; Munns, Gordon Richard; Forrester, Julie; Standen, Michael Charles Henry; Worthington, Paul Anthony; and Jones, Raymond Vincent Heavon, 6,015,905, Cl. 546-288.000.

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Thompson, Raymon F.; Berner, Robert W.; Curtis, Gary L.; Culliton, Stephen P.; and Wright, Blaine G., 6,014,817, Cl. 34-60.000.

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Baker, James R., Jr.; Wright, D. Craig; Hayes, Michael M.; Hamouda, Tarek; and Brisker, Joan, 6,015,832, Cl. 514-546.000.

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Oppenheim, Daniel P.; Abrams, Steven R.; Pazel, Donald P.; and Wright, James L., 6,015,949, Cl. 84-613.000.

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Sishtla, Vishnu M.; and Wright, Kenneth A., 6,015,259, Cl. 415-166.000.

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Rabeony, Manese; Peiffer, Dennis George; Costello, Christine Ann; Colle, Karla Schall; Wright, Pamela J; and Talley, Larry Dalton, 6,015,929, Cl. 585-15.000.

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Heath, Paul Roy; Orange, Paul Richard; Pearson, Ronald Carl Alan; and Wright, Simon Ralph, 6,015,888, Cl. 536-23.500.

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Shay, Jerry W.; Wright, Woodring E.; Piatyszek, Mieczyslaw A.; Corey, David R.; and Norton, James C., 6,015,710, Cl. 435-375.000.

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Ivri, Yehuda; De Young, Linda R.; Wu, Cheng H.; Cater, Miro S.; Kumar, Vijay; and Flierl, Markus, 6,014,970, Cl. 128-200.160.

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Huang, Kuo Ching; Lee, Yu Hua; and Wu, Cheng-Ming, 6,015,734, Cl. 438-253.000.

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Aslam, Muhammed; Wu, Fangsheng; and Bobo, Robert D., 6,016,410, Cl. 399-69.000.

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Minor, Raymond B.; McGregor, Gordon L.; Wu, Huey Shen; and Lash, Daniel J., 6,015,610, Cl. 428-315.700.

Wu, James (Cheng-Ming): *See*—
Lee, Yu-Hua; and Wu, James (Cheng-Ming), 6,015,733, Cl. 438-253.000.

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Chen, Coming; Wu, Juan-Yuan; and Lur, Water, 6,015,755, Cl. 438-692.000.

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McHugh, Robert G.; Ho, Yu-Ming; and Wu, Ming-Chuan, 6,015,305, Cl. 439-135.000.

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Alanine, Alexander; Büttelmann, Bernd; Neidhart, Marie-Paule Heitz; Pinard, Emmanuel; and Wyler, René, 6,015,824, Cl. 514-375.000.

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Brewer, Charles R., III, 6,015,131, Cl. 248-638.000.
Budnik, Roger W.; Pacer, James M.; Raj, Guru B.; Shoemaker, Ralph A.; Swales, Michael G.; and Beard, Michael E., 6,016,204, Cl. 358-1.140.
Murti, Dasarao K.; and Foucher, Daniel A., 6,015,645, Cl. 430-59.000.
Schwarz, William M., Jr., 6,015,620, Cl. 428-411.100.
Siegel, Robert P., 6,015,146, Cl. 271-98.000.
Silverberg, Morton; and Roller, George J., 6,016,205, Cl. 358-1.600.

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Trimberger, Stephen M., 6,016,063, Cl. 326-81.000.

Xu, Wayne: *See*—
Kuder, James E.; Cangiano, Dominick; Provino, Vincent J.; and Xu, Wayne, 6,015,524, Cl. 264-173.120.

Yaacovi, Yoram: *See*—
Chu, Lon-Chan; Yaacovi, Yoram; and Settle, Kent F., 6,016,508, Cl. 709-223.000.

Yabuta, Motoshi: *See*—
Ikushima, Satoshi; Wada, Seiji; Okumura, Yasumasa; Aida, Haruhiko; Yabuta, Motoshi; Yukawa, Yoshiyuki; and Hasada, Ken-ichi, 6,015,848, Cl. 523-427.000.

Yaffe, Max R.: *See*—
Martinchek, Gregory A.; and Yaffe, Max R., 6,015,484, Cl. 205-775.500.

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Okada, Masahiko; Ban, Takashi; Hirose, Tatsuya; Yagi, Kiyoshi; Hoshino, Tatsuyuki; Mori, Hidefumi; Okabe, Takanori; and Hoshino, Nobuaki, 6,015,349, Cl. 464-31.000.

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Juran, Carleen J.; Yakimow, Kristin; Shelton, Michael B.; Stroebel, John C.; Markowitz, H. Toby; Vatterott, Pierce; and Strandquist, Harry A., 6,016,447, Cl. 607-27.000.

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Kawakami, Kenichi; Susa, Masahiko; Katsuhiko, Kobayashi; Yamada, Akio; Yamashita, Koichi; and Nishio, Naoki, 6,015,975, Cl. 250-492.220.

Yamada, Akira: *See*—
Suzuki, Kazumasa; Mohri, Atsushi; Yamada, Akira; and Yoshida, Toyohiko, 6,016,543, Cl. 712-233.000.

Yamada, Hideaki: *See*—
Mihara, Yasuhiro; Utagawa, Takashi; Yamada, Hideaki; and Asano, Yasuhisa, 6,015,697, Cl. 435-87.000.

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Katsukura, Noboru; Yamada, Takehiko; and Tochikubo, Eiji, 6,015,490, Cl. 210-151.000.

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Yamagishi, Masahiko: *See*—
Okusawa, Tsutomu; Koyama, Kazuhito; Yamagishi, Masahiko; Hatamiya, Shigeo; Ajiro, Taiko; Sunou, Megumi; and Ishigaki, Yukio, 6,014,863, Cl. 60-653.000.

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Yamaguchi, Jun: *See*—
Kimura, Takahiko; Ichikawa, Yoshiki; Yamaguchi, Jun; Tsuji, Masahiro; and Sanada, Yoshiaki, 6,016,411, Cl. 399-103.000.

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Yamaguchi, Ryuji: *See*—
Yamada, Takeshi; Matsuo, Kazuhiro; Yamaguchi, Ryuji; and Yamazaki, Akihiro, 6,015,696, Cl. 435-69.800.
Yamaha Corporation: *See*—
Yamaryo, Shigeru, 6,015,946, Cl. 84-380.00R.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Mori, Kazuaki, 6,015,487, Cl. 210-90.000.
Nanami, Masayoshi, 6,015,320, Cl. 440-88.000.
Ozawa, Sigeyuki; and Nakase, Ryoichi, 6,015,321, Cl. 440-88.000.
Uematsu, Yoshikatsu; Kuragaki, Naoyoshi; and Takeuchi, Kazuya, 6,015,318, Cl. 440-61.000.
Yamaji, Akira: *See*—
Sobajima, Yoshihiro; Shimouse, Masashi; Hamaura, Masahide; and Yamaji, Akira, 6,015,857, Cl. 524-451.000.
Yamakage, Tomoo: *See*—
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Nakamura, Nobutaka; and Yamaki, Masayo, 6,016,548, Cl. 713-323.000.
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Ichinohe, Shoji; Yanagisawa, Hideyoshi; and Yamamoto, Akira, 6,015,870, Cl. 528-30.000.
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Elcock, Robin William; Yamamoto, Albert K.; and Louw, John A., 6,015,351, Cl. 470-10.000.
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Kubotsu, Kazuhisa; Yamamoto, Sachiko; and Kida, Masaaki, 6,015,679, Cl. 435-7.100.
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Unami, Toshihiko; Inoue, Jiro; Yamamoto, Takashi; and Takeshima, Tetsuo, 6,016,024, Cl. 310-345.000.
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Tokura, Norihito; Takahashi, Shigeki; Yamamoto, Tsuyoshi; and Kataoka, Mitsuhiro, 6,015,737, Cl. 438-270.000.
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Urata, Kazuya; Yoshimi, Naoto; Kubota, Takahiro; Yamashita, Masaaki; and Haruta, Yasuhiko, 6,015,628, Cl. 428-623.000.
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Iio, Kenichi; Sakamoto, Koichi; Yamashita, Sadao; Hiratsuka, Toshihiro; Sonoda, Tomiya; and Mikami, Shigeyuki, 6,016,090, Cl. 333-202.000.
Yamashita, Seiji: *See*—
Fujiwara, Toshiki; Yamashita, Seiji; and Suzuki, Keiichi, 6,015,909, Cl. 548-243.000.
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Yamaguchi, Masayuki; Yamashita, Yukihide; and Mori, Kenichiro, 6,015,585, Cl. 427-8.000.
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Onishi, Katsuhiro; Yamauchi, Kiminori; Tsukada, Hideaki; Ueda, Yukinori; and Masuda, Fumitoshi, 6,016,098, Cl. 338-160.000.
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Daly, Thomas Patrick; Koskol, Joseph Edward; Madigan, Kevin Robert; Takagi, Jun; and Yamauchi, Naofumi, 6,015,113, Cl. 242-474.500.
Yamauchi, Yasuji; Yamanaka, Toshio; Okumura, Masafumi; Hirai, Masashi; Taka, Kyousuke; Uno, Kinji; Yoneda, Yoshiharu; and Yamauchi, Hirokazu, to Sharp Kabushiki Kaisha. Paper-punching device for use in a image-forming apparatus. 6,014,920, Cl. 83-560.000.
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Yonemura, Masatsugu, 6,014,849, Cl. 52-586.100.
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Yamada, Takeshi; Matsuo, Kazuhiro; Yamaguchi, Ryuji; and Yamazaki, Akihiro, 6,015,696, Cl. 435-69.800.
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Matsushima, Shinji; and Yamazaki, Mitsuhiro, 6,016,518, Cl. 710-8.000.
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Nito, Keiichi; Yasuda, Akio; Takanashi, Hidehiko; and Yang, Ying Bao, 6,016,133, Cl. 345-89.000.
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Kanematsu, Daigoro; Takenouchi, Masanori; Otsuka, Naoji; Ujita, Toshihiko; Yano, Kentaro; and Iwasaki, Osamu, 6,015,210, Cl. 347-87.000.
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Yap, Walter N.: *See*—
Perez, Sergio M.; and Yap, Walter N., 6,015,123, Cl. 248-220.100.
Yapel, Robert A.: *See*—
Yonkoski, Roger K.; Strobush, Brian L.; Ludemann, Thomas J.; and Yapel, Robert A., 6,015,593, Cl. 427-379.000.
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Nito, Keiichi; Yasuda, Akio; Takanashi, Hidehiko; and Yang, Ying Bao, 6,016,133, Cl. 345-89.000.
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Ito, Wataru; Yasuda, Hiroaki; and Nanami, Shoji, 6,016,356, Cl. 382-132.000.
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Daifotis, Anastasia G.; Yates, A. John; and Santora, Arthur C., II, 6,015,801, Cl. 514-108.000.
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Burns, Elizabeth G.; Lawrence, Kristine B.; Bowman, Wayne A.; and Yau, Hwei-Ling, 6,015,772, Cl. 503-227.000.
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Wu, Ye-Te; and Tseng, Chia-Jui, 6,016,536, Cl. 711-173.000.
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190-254 OG D-00 -- 27 : QL 3

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Grimes, Lahon H.; Grimes, Karl V.; and Yelton, James E., 6,015,019, Cl. 180-53.200.

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Lin, Shi-Lung; and Ying, Shao-Yao, 6,015,676, Cl. 435-6.000.

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Qiu, Cindy Xing; Shih, Yi-Chi; and Yip, Lap Sum, 6,016,092, Cl. 333-262.000.

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Sono, Yasuhiro; Koike, So; and Hirano, Masao, 6,014,846, Cl. 52-204.100.

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Fukuda, Takeshi; and Shido, Ryuichi, 6,015,456, Cl. 106-286.500.

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Kawazu, Yukio; Suzuki, Toshimitsu; Yuasa, Masayuki; Yokomizo, Yuichi; Majima, Toshiro; Ito, Takao; Nakashima, Takuji; and Nozawa, Akira, 6,015,925, Cl. 564-316.000.

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Yamagishi, Toru; Miyazaki, Ken; and Yokouchi, Kentaro, 6,016,382, Cl. 386-109.000.

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Yamauchi, Yasuji; Yamanaka, Toshio; Okumura, Masafumi; Hirai, Masashi; Taka, Kyousuke; Uno, Kinji; Yoneda, Yoshiharu; and Yamauchi, Hirokazu, 6,014,920, Cl. 83-560.000.

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Yoo, Chue San: *See*—
Wang, Chen-Jong; Huang, Jenn Ming; and Yoo, Chue San, 6,015,730, Cl. 438-241.000.

Yoo, Han-joo: *See*—
Kim, Jae-in; and Yoo, Han-joo, 6,014,865, Cl. 62-151.000.

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Lee, Chul-woo; Chung, Chong-sam; and Yoo, Jang-hoon, 6,016,293, Cl. 369-44.250.

Yoon, Il: *See*—
Shin, Tae Hwan; Kim, Jong Nam; Choi, Tae Sun; and Yoon, Il, 6,016,365, Cl. 382-233.000.

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Guzik, Andrew T.; Ellis, David L.; Yorio, Rudy; Pratt, Steven D.; and Muthuswamy, Sivakumar, 6,015,970, Cl. 250-229.000.

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Yuhara, Yukitomo, 6,014,978, Cl. 132-293.000.

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Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Martin, Varenka; Weigelt, Oliver; Winckel, Laurent; and Yoshida, Satoshi, 6,016,331, Cl. 375-371.000.

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Ohashi, Masakazu; Kaminaga, Kozo; Takanashi, Kenji; Setogawa, Toshiaki; Yoshida, Teruyuki; and Tachi, Katsuichi, 6,016,182, Cl. 352-37.000.

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Suzuki, Kazumasa; Mohri, Atsushi; Yamada, Akira; and Yoshida, Toyohiko, 6,016,543, Cl. 712-233.000.

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Tsuji, Kouichi; Yoshida, Yoshihiro; and Uwano, Takashi, 6,015,680, Cl. 435-7.230.

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Itagaki, Toshihiro; and Yoshikawa, Sadao, 6,016,284, Cl. 365-233.500.

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Urata, Kazuya; Yoshimi, Naoto; Kubota, Takahiro; Yamashita, Masaaki; and Haruta, Yasuhiko, 6,015,628, Cl. 428-623.000.

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Noguchi, Minori; Kenbo, Yukio; Oshida, Yoshitada; Shiba, Masataka; Yoshitaka, Yasuhiro; and Murayama, Makoto, 6,016,187, Cl. 355-53.000.

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Ishibuchi, Seigo; Morimoto, Hiroshi; Fukunari, Atsushi; Inoue, Hiroyoshi; and Naka, Yoichi, 6,015,829, Cl. 514-404.000.

Yoshitomi, Sumie: *See*—
Watanabe, Tatsuya; Yoshitomi, Sumie; and Sasada, Reiko, 6,015,552, Cl. 424-85.100.

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You, Nam-hee: *See*—
Kim, In-seop; Kim, Seung-uhn; You, Nam-hee; and Lee, Soon-young, 6,015,706, Cl. 435-252.100.

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Woudenberg, Timothy M.; Bodner, Kevin S.; Connell, Charles R.; Shigeura, John; Tracy, David H.; and Young, Eugene F., 6,015,674, Cl. 435-6.000.

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LaVon, Gary Dean; Young, Gerald Alfred; and Taylor, Gregory Wade, 6,015,935, Cl. 604-378.000.

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Zwart, Hans J.; Tyler, Lawrence R.; Palermo, Thomas J.; Bladel, Kevin Van; Young, Roderick A.; and Jervis, James E., 6,015,382, Cl. 600-207.000.

Yovanof, Gregory S.: *See*—
Konstantinides, Kontantinos; Natarajan, Balas K.; and Yovanof, Gregory S., 6,016,366, Cl. 382-260.000.

Ypma, Marco: *See*—
Boerstoel, Hanneke; and Ypma, Marco, 6,014,997, Cl. 152-151.000.

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Liu, Chung-Shi; Yu, Chen-Hua Douglas; Lai, Jane-Bai; and Chen, Lih-Juann, 6,015,749, Cl. 438-628.000.

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Yu, Shuyuan: *See*—
Pon, Richard T.; and Yu, Shuyuan, 6,015,895, Cl. 536-25.300.

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Walker, David H.; and Yu, Xue-Jie, 6,015,691, Cl. 435-69.100.

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Kawazu, Yukio; Suzuki, Toshimitsu; Yuasa, Masayuki; Yokomizo, Yuichi; Majima, Toshiro; Ito, Takao; Nakashima, Takuji; and Nozawa, Akira, 6,015,925, Cl. 564-316.000.

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Yui, Takayuki: *See*—
Kubota, Osamu; Arai, Katsunori; Sato, Yuji; Yui, Takayuki; and Kanakubo, Toshihisa, 6,015,336, Cl. 451-251.000.

Yukawa, Yoshiyuki: *See*—
Ikushima, Satoshi; Wada, Seiji; Okumura, Yasumasa; Aida, Haruhiko; Yabuta, Motoshi; Yukawa, Yoshiyuki; and Hasada, Ken-ichi, 6,015,848, Cl. 523-427.000.

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Yoshikawa, Shouichi; Yukino, Shinya; and Naba, Masahiro, 6,016,238, Cl. 360-99.080.

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Turgeon, Thomas A.; Colburn, David J.; and Yungers, Christopher R., 6,015,106, Cl. 241-69.000.

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Dobler, Klaus; Zabler, Erich; Dukart, Anton; and Herrmann, Thomas, 6,016,104, Cl. 340-646.000.

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Williamson, John M.; Guterman, Alexandre J.; Zani, Robert; Newell, Terry; and Brown, Anthony K. Dale, 6,016,086, Cl. 333-109.000.

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Zehavi, Ephraim: *See*—
Wolf, Jack Keil; and Zehavi, Ephraim, 6,016,568, Cl. 714-792.000.

Zeman, Richard J.: *See*—
Etlinger, Joseph D.; and Zeman, Richard J., 6,015,837, Cl. 514-653.000.

Zeneca Limited: *See*—
Barker, Andrew John, 6,015,814, Cl. 514-259.000.
Mistry, Prahalad Manibhai; and Kenyon, Ronald Wynford, 6,015,896, Cl. 540-134.000.
Ritchie, David John; Munns, Gordon Richard; Forrester, Julie; Standen, Michael Charles Henry; Worthington, Paul Anthony; and Jones, Raymond Vincent Heavon, 6,015,905, Cl. 546-288.000.
Scher, Herbert B.; and Chen, Jin Ling, 6,015,571, Cl. 424-408.000.

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Suzuki, Fujio; Sasaki, Hidetaka; and Kobayashi, Makiko, 6,015,796, Cl. 514-45.000.

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Zettler, Mark W.: *See*—
Siddall, Thomas L.; Emonds, Mark V. M.; Krumel, Karl L.; Schomaker, Jennifer M.; and Zettler, Mark W., 6,015,911, Cl. 548-369.400.

Zexel Corporation: *See*—
Kubota, Osamu; Arai, Katsunori; Sato, Yuji; Yui, Takayuki; and Kanakubo, Toshihisa, 6,015,336, Cl. 451-251.000.

Zhang, Hong: *See*—
Monia, Brett P.; Baker, Brenda F.; Zhang, Hong; and Cowsert, Lex M., 6,015,712, Cl. 435-375.000.

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Mowdood, Syed K.; Zhang, Ping; and Bettè , Cristiano, 6,014,998, Cl. 152-564.000.

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Xia, Changfeng; and Zhang, Yanwei, 6,015,464, Cl. 118-715.000.

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Kelleher, Judith A.; Maples, Kirk R.; and Zhang, Yong-Kang, 6,015,831, Cl. 514-445.000.

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Zhuang, Wei-Wei; Nguyen, Tue; Stecker, Greg Michael; Evans, David Russell; and Hsu, Sheng Teng, to Sharp Laboratories of America, Inc. Allyl-derived precursor and synthesis method. 6,015,918, Cl. 556-117.000.

Ziaja, Henry J.: *See*—
Reed, David B.; Cooper, Mark; Rosink, Kenneth E.; and Ziaja, Henry J., 6,014,893, Cl. 73-49.700.

Ziegelmuller, Frank L.: *See*—
Herrick, Diane M.; Tombs, Thomas N.; and Ziegelmuller, Frank L., 6,016,415, Cl. 399-162.000.

Zimmerman, Achim; Schaffner, Heinz; Polly, Edgar; and Zimmermann, Helmut, to Schneider Automation, Inc. I/O modular terminal having a plurality of data registers and an identification register and providing for interfacing between field devices and a field master. 6,016,523, Cl. 710-63.000.

Zimmerman, Steven M.: *See*—
Jones, Gary W.; Howard, Webster E.; and Zimmerman, Steven M., 6,016,033, Cl. 313-506.000.

Zimmermann, Helmut: *See*—
Zimmerman, Achim; Schaffner, Heinz; Polly, Edgar; and Zimmermann, Helmut, 6,016,523, Cl. 710-63.000.

Zingerman, Yuli: *See*—
Goldstein, Jonathan; Givon, Menachem; and Zingerman, Yuli, 6,015,636, Cl. 429-229.000.

Zorman, Ilan: *See*—
Weiss, Anthony J.; Karmi, Yair; Zorman, Ilan; and Harel, Haim, 6,016,421, Cl. 455-63.000.

Zuk, Peter, Jr., to Hemasure Inc. Filtration device useable for removal of leukocytes and other blood components. 6,015,500, Cl. 210-767.000.

Zuta, Idan: *See*—
Zuta, Marc; and Zuta, Idan, 6,016,080, Cl. 331-25.000.

Zuta, Marc; and Zuta, Idan. Computer based fast phase difference measuring unit and PLL using same. 6,016,080, Cl. 331-25.000.

Zwakenberg, Ralph: *See*—
Lasko, William E.; Zwakenberg, Ralph; and Wilson, Rodney, 6,015,265, Cl. 416-247.00R.

Zwart, Hans J.; Tyler, Lawrence R.; Palermo, Thomas J.; Bladel, Kevin Van; Young, Roderick A.; and Jervis, James E., to General Surgical Innovations, Inc. Inflatable manipulator for organ positioning during surgery and method of use. 6,015,382, Cl. 600-207.000.

1184949 Ontario Inc.: *See*—
Brown, L. Edward; and Resch, Adam R., 6,015,377, Cl. 600-9.000.

3Com Corp.: *See*—
DiGiacomo, Joseph; Lecinski, Daniel J.; Laughlin, Kenneth S.; and English, Susan I., 6,015,197, Cl. 312-223.600.
Lowe, Glen H., 6,016,513, Cl. 709-250.000.
Rittmueller, Stephen P.; Annerino, Frank J.; Dreher, Mark R.; and Chastain, Scott A., 6,016,346, Cl. 379-420.000.

3M Innovative Properties Company: *See*—
Abe, Hidetoshi, 6,015,606, Cl. 428-214.000.
Danisch, Susan G.; Berrigan, Michael R.; and Carey, Patrick H., Jr., 6,014,971, Cl. 128-201.250.
David, Moses M., 6,015,597, Cl. 427-577.000.
Heyer, Thomas J. D.; Wandmacher, Robert A.; Chor, Lawrence C.; and Larson, John T., 6,015,629, Cl. 428-625.000.
Ou-Yang, David T., 6,015,603, Cl. 428-195.000.
Stern, Richard M.; and Fan, Wei-Qiang, 6,015,838, Cl. 516-12.000.
Turgeon, Thomas A.; Colburn, David J.; and Yungers, Christopher R., 6,015,106, Cl. 241-69.000.
Williams, Donald J., 6,015,624, Cl. 428-500.000.
Yonkoski, Roger K.; Strobush, Brian L.; Ludemann, Thomas J.; and Yapel, Robert A., 6,015,593, Cl. 427-379.000.

3T True Temperature Technologies: *See*—
Glazman, Evgeny, 6,016,190, Cl. 356-43.000.

8× 8, Inc.: *See*—
Kleck, James, 6,016,524, Cl. 710-65.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18th DAY OF JANUARY, 2000

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Acer Peripherals Inc.: *See*—
Liou, Dong-Yih; Tseng, Wen-Chi; and Liao, Chung-Chi, RE. 36,511, Cl. 369-77.100.

Aitken, Bruce G.; and Newhouse, Mark A., to Corning Inc. Gallium sulfide glasses. RE. 36,513, Cl. 385-144.000.

Analog Devices: *See*—
Howe, Roger T.; and Bart, Stephen, RE. 36,498, Cl. 73-514.160.

Ando, Hiromitsu; Takemura, Jun; Nakane, Kazuyoshi; and Saeki, Tetsuji, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. RE. 36,500, Cl. 123-193.400.

Araki, Takeshi; Tani, Yoshihiro; Ikeda, Hideo; and Okabe, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Thin film magnet, cylindrical ferromagnetic thin film and production method thereof. RE. 36,517, Cl. 427-132.000.

Bart, Stephen: *See*—
Howe, Roger T.; and Bart, Stephen, RE. 36,498, Cl. 73-514.160.

Betti, Giorgio: *See*—
Gornati, Silvano; Betti, Giorgio; Sacchi, Fabrizio; Vai, Gianfranco; and Zuffada, Maurizio, RE. 36,508, Cl. 348-558.000.

Blalock, Guy T.: *See*—
Dennison, Charles H.; and Blalock, Guy T., RE. 36,518, Cl. 438-586.000.

Burns, Robert R. Method of on-site refueling using electronic identification tags, reading probe, and a truck on-board computer. RE. 36,510, Cl. 364-479.010.

California Microwave: *See*—
Dempsey, Richard C.; Drago, Daniel W.; and Jelinek, Carl O., RE. 36,506, Cl. 343-753.000.

Caterpillar Inc.: *See*—
Feucht, Dennis D., RE. 36,499, Cl. 123-90.120.

Clark, Michael L., to Honeywell, Inc. Pole mounted revolving air circulating fan. RE. 36,514, Cl. 416-110.000.

Corning Inc.: *See*—
Aitken, Bruce G.; and Newhouse, Mark A., RE. 36,513, Cl. 385-144.000.

Dempsey, Richard C.; Drago, Daniel W.; and Jelinek, Carl O., to California Microwave. Antenna design using a high index, low loss material. RE. 36,506, Cl. 343-753.000.

Dennison, Charles H.; and Blalock, Guy T., to Micron Technology, Inc. Method for making electrical contact with an active area through submicron contact openings and a semiconductor device. RE. 36,518, Cl. 438-586.000.

Drago, Daniel W.: *See*—
Dempsey, Richard C.; Drago, Daniel W.; and Jelinek, Carl O., RE. 36,506, Cl. 343-753.000.

Eastman Kodak Company: *See*—
Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, RE. 36,519, Cl. 503-227.000.

Eaton Corporation: *See*—
Organek, Gregory J.; Preston, David M.; and Janson, David A., RE. 36,502, Cl. 192-35.000.

Feucht, Dennis D., to Caterpillar Inc. Method and apparatus for holding a cylinder valve closed during combustion. RE. 36,499, Cl. 123-90.120.

Ford Global Technologies, Inc.: *See*—
Treharne, William David; and Moore, Ronald Gerard, RE. 36,505, Cl. 340-825.310.

General Electric Co.: *See*—
Tomlinson, Leroy O., RE. 36,497, Cl. 60-39.020.

Gornati, Silvano; Betti, Giorgio; Sacchi, Fabrizio; Vai, Gianfranco; and Zuffada, Maurizio, to SGS-Thomson Microelectronics S.r.l. Method of automatically measuring the horizontal scan frequency of a composite synchronism signal, and an electronic circuit operating in accordance with the method. RE. 36,508, Cl. 348-558.000.

Halczenko, Wasyl: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.

Han, Loi: *See*—
Rubley, John S.; and Han, Loi, RE. 36,503, Cl. 250-208.100.

Hartman, George D.: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.

Hensens, Otto D.: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.

Hiemisch, Christian, to Otto Bock Orthopaedische Industrie Besitz - und Verwaltungs KG. Connecting part between leg prosthesis components. RE. 36,521, Cl. 623-38.000.

Holland Sweetener Company V.o.F.: *See*—
Slangen, Hubertus J. M., RE. 36,515, Cl. 424-489.000.

Honeywell, Inc.: *See*—
Clark, Michael L., RE. 36,514, Cl. 416-110.000.

Hoover, Gregory A.; Hoover, Roger A.; Rowe, E. Riley; and Rowe, David L. Method for producing inflated dunnage. RE. 36,501, Cl. 156-147.000.

Hoover, Roger A.: *See*—
Hoover, Gregory A.; Hoover, Roger A.; Rowe, E. Riley; and Rowe, David L., RE. 36,501, Cl. 156-147.000.

Houck, David R.: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.

Howe, Roger T.; and Bart, Stephen, to Analog Devices. Sensor with separate actuator and sense fingers. RE. 36,498, Cl. 73-514.160.

Ikeda, Hideo: *See*—
Araki, Takeshi; Tani, Yoshihiro; Ikeda, Hideo; and Okabe, Masashi, RE. 36,517, Cl. 427-132.000.

Inamine, Edward S.: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.

Iu, Siu L., to Matsushita Electric Corporation of America. Apparatus and method for processing groups of fields in a video data compression system to encode a single frame as an I-field and a P-field. RE. 36,507, Cl. 348-415.000.

Janson, David A.: *See*—
Organek, Gregory J.; Preston, David M.; and Janson, David A., RE. 36,502, Cl. 192-35.000.

Jelinek, Carl O.: *See*—
Dempsey, Richard C.; Drago, Daniel W.; and Jelinek, Carl O., RE. 36,506, Cl. 343-753.000.

Kabushiki Kaisha Toshiba: *See*—
Shigihara, Hideo, RE. 36,509, Cl. 348-564.000.

Kung, Teh-Ming: *See*—
Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, RE. 36,519, Cl. 503-227.000.

Landry, Christine J. T.: *See*—
Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, RE. 36,519, Cl. 503-227.000.

Lee, Ta Jyh: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.

Lehrer, Robert, to Robert Lehrer Associates, Inc. Method of treating fluids with a filter. RE. 36,516, Cl. 426-417.000.

Liao, Chung-Chi: *See*—
Liou, Dong-Yih; Tseng, Wen-Chi; and Liao, Chung-Chi, RE. 36,511, Cl. 369-77.100.

Liou, Dong-Yih; Tseng, Wen-Chi; and Liao, Chung-Chi, to Acer Peripherals Inc. Ejector for a tray device. RE. 36,511, Cl. 369-77.100.

Lum, Kin Kwong; Landry, Christine J. T.; and Kung, Teh-Ming, to Eastman Kodak Company. Plasticizers for dye-donor element used in thermal dye transfer. RE. 36,519, Cl. 503-227.000.

Matsushita Electric Corporation of America: *See*—
Iu, Siu L., RE. 36,507, Cl. 348-415.000.

Merck & Co., Inc.: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.

Micron Technology, Inc.: *See*—
Dennison, Charles H.; and Blalock, Guy T., RE. 36,518, Cl. 438-586.000.

Microtek International, Inc.: *See*—
Rubley, John S.; and Han, Loi, RE. 36,503, Cl. 250-208.100.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Araki, Takeshi; Tani, Yoshihiro; Ikeda, Hideo; and Okabe, Masashi, RE. 36,517, Cl. 427-132.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Ando, Hiromitsu; Takemura, Jun; Nakane, Kazuyoshi; and Saeki, Tetsuji, RE. 36,500, Cl. 123-193.400.

Moore, Ronald Gerard: *See*—
Treharne, William David; and Moore, Ronald Gerard, RE. 36,505, Cl. 340-825.310.

Nakane, Kazuyoshi: *See*—
Ando, Hiromitsu; Takemura, Jun; Nakane, Kazuyoshi; and Saeki, Tetsuji, RE. 36,500, Cl. 123-193.400.

Newhouse, Mark A.: *See*—
Aitken, Bruce G.; and Newhouse, Mark A., RE. 36,513, Cl. 385-144.000.

Okabe, Masashi: *See*—
Araki, Takeshi; Tani, Yoshihiro; Ikeda, Hideo; and Okabe, Masashi, RE. 36,517, Cl. 427-132.000.

Organek, Gregory J.; Preston, David M.; and Janson, David A., to Eaton Corporation. Clutch ball ramp actuator with drive and coast apply. RE. 36,502, Cl. 192-35.000.

Otto Bock Orthopaedische Industrie Besitz - und Verwaltungs KG: *See*—
Hiemisch, Christian, RE. 36,521, Cl. 623-38.000.

Preston, David M.: *See—*
Organek, Gregory J.; Preston, David M.; and Janson, David A., RE. 36,502, Cl. 192-35.000.
Robert Lehrer Associates, Inc.: *See—*
Lehrer, Robert, RE. 36,516, Cl. 426-417.000.
Rowe, David L.: *See—*
Hoover, Gregory A.; Hoover, Roger A.; Rowe, E. Riley; and Rowe, David L., RE. 36,501, Cl. 156-147.000.
Rowe, E. Riley: *See—*
Hoover, Gregory A.; Hoover, Roger A.; Rowe, E. Riley; and Rowe, David L., RE. 36,501, Cl. 156-147.000.
Rubley, John S.; and Han, Loi, to Microtek International, Inc. Transmissive/reflective optical scanning apparatus. RE. 36,503, Cl. 250-208.100.
Sacchi, Fabrizio: *See—*
Gornati, Silvano; Betti, Giorgio; Sacchi, Fabrizio; Vai, Gianfranco; and Zuffada, Maurizio, RE. 36,508, Cl. 348-558.000.
Saeki, Tetsuji: *See—*
Ando, Hiromitsu; Takemura, Jun; Nakane, Kazuyoshi; and Saeki, Tetsuji, RE. 36,500, Cl. 123-193.400.
SGS-Thomson Microelectronics S.r.l.: *See—*
Gornati, Silvano; Betti, Giorgio; Sacchi, Fabrizio; Vai, Gianfranco; and Zuffada, Maurizio, RE. 36,508, Cl. 348-558.000.
Shigihara, Hideo, to Kabushiki Kaisha Toshiba. Television signal transmission and reception system with multi-screen display for tuning operation. RE. 36,509, Cl. 348-564.000.
Slangen, Hubertus J. M., to Holland Sweetener Company V.o.F. Process for the treatment of aspartame. RE. 36,515, Cl. 424-489.000.
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, to Merck & Co., Inc. HMG-CoA reductase inhibitors. RE. 36,520, Cl. 514-548.000.
Solatube International, Inc.: *See—*
Sutton, Steven Michael, RE. 36,496, Cl. 52-200.000.
Sone, Takahiro, to Star Micronics Co., Ltd. Method of fabricating an electroacoustic transducer. RE. 36,512, Cl. 381-396.000.
Star Micronics Co., Ltd.: *See—*
Sone, Takahiro, RE. 36,512, Cl. 381-396.000.
Stokker, Gerald E.: *See—*
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta Jyh, RE. 36,520, Cl. 514-548.000.
Sutton, Steven Michael, to Solatube International, Inc. Skylight. RE. 36,496, Cl. 52-200.000.
Takemura, Jun: *See—*
Ando, Hiromitsu; Takemura, Jun; Nakane, Kazuyoshi; and Saeki, Tetsuji, RE. 36,500, Cl. 123-193.400.
Tani, Yoshihiro: *See—*
Araki, Takeshi; Tani, Yoshihiro; Ikeda, Hideo; and Okabe, Masashi, RE. 36,517, Cl. 427-132.000.
Texas Instruments Incoporated: *See—*
Wallace, Steven J.; and Watts, LaVaughn F., Jr., RE. 36,522, Cl. 710-19.000.
Tomlinson, Leroy O., to General Electric Co. Combined cycle with steam cooled gas turbine. RE. 36,497, Cl. 60-39.020.
Treharne, William David; and Moore, Ronald Gerard, to Ford Global Technologies, Inc. Method and apparatus for programming a spare key into a security system. RE. 36,505, Cl. 340-825.310.
Tseng, Wen-Chi: *See—*
Liou, Dong-Yih; Tseng, Wen-Chi; and Liao, Chung-Chi, RE. 36,511, Cl. 369-77.100.
Vai, Gianfranco: *See—*
Gornati, Silvano; Betti, Giorgio; Sacchi, Fabrizio; Vai, Gianfranco; and Zuffada, Maurizio, RE. 36,508, Cl. 348-558.000.
Wallace, Steven J.; and Watts, LaVaughn F., Jr., to Texas Instruments Incoporated. Method and apparatus for dynamically interfacing with a plurality of peripheral ports. RE. 36,522, Cl. 710-19.000.
Watts, LaVaughn F., Jr.: *See—*
Wallace, Steven J.; and Watts, LaVaughn F., Jr., RE. 36,522, Cl. 710-19.000.
Zuffada, Maurizio: *See—*
Gornati, Silvano; Betti, Giorgio; Sacchi, Fabrizio; Vai, Gianfranco; and Zuffada, Maurizio, RE. 36,508, Cl. 348-558.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Broomall, James R.; Foster, Christine M.; Theorin, Craig R.; and Widdoes, Peter A., to W. L. Gore & Associates, Inc. Composite conductor having improved high frequency signal transmission characteristics. B1 574,260, Cl. 174-102.00R.
Cloeren Company, The: *See—*
Cloeren, Peter F.; and Schulz, Rolf P., B1 505,609, Cl. 425-381.000.
Cloeren, Peter F.; and Schulz, Rolf P., to Cloeren Company, The. Internal deckle system. B1 505,609, Cl. 425-381.000.
Foster, Christine M.: *See—*
Broomall, James R.; Foster, Christine M.; Theorin, Craig R.; and Widdoes, Peter A., B1 574,260, Cl. 174-102.00R.
Hebrew University of Jerusalem, Yissum Research Development Company of the: *See—*
Sintov, Amnon; and Rubinstein, Abraham, B1 525,634, Cl. 514-777.000.
Perio Products, Ltd.: *See—*
Sintov, Amnon; and Rubinstein, Abraham, B1 525,634, Cl. 514-777.000.
Rubinstein, Abraham: *See—*
Sintov, Amnon; and Rubinstein, Abraham, B1 525,634, Cl. 514-777.000.
Schulz, Rolf P.: *See—*
Cloeren, Peter F.; and Schulz, Rolf P., B1 505,609, Cl. 425-381.000.
Sintov, Amnon; and Rubinstein, Abraham, to Perio Products, Ltd.; and Hebrew University of Jerusalem, Yissum Research Development Company of the. Colonic drug delivery system. B1 525,634, Cl. 514-777.000.
Theorin, Craig R.: *See—*
Broomall, James R.; Foster, Christine M.; Theorin, Craig R.; and Widdoes, Peter A., B1 574,260, Cl. 174-102.00R.
W. L. Gore & Associates, Inc.: *See—*
Broomall, James R.; Foster, Christine M.; Theorin, Craig R.; and Widdoes, Peter A., B1 574,260, Cl. 174-102.00R.
Widdoes, Peter A.: *See—*
Broomall, James R.; Foster, Christine M.; Theorin, Craig R.; and Widdoes, Peter A., B1 574,260, Cl. 174-102.00R.

LIST OF DESIGN PATENTEES

A. Johansson Konstruktion AB: *See—*
Johansson, Arne, 419,225, Cl. D23-280.200.
Abbas, Greg Allen, Camouflage moisture-proof jacket affixed to turkey call. 419,100, Cl. D10-121.000.
Abbott, Carolyn: *See—*
Feldmeier, Daniel R.; and Abbott, Carolyn, 419,062, Cl. D9-346.000.
Abbruzzese, Domenico: *See—*
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,991, Cl. D6-381.000.
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,992, Cl. D6-381.000.
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,993, Cl. D6-381.000.
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,994, Cl. D6-381.000.
Abdallah, Mohammad: *See—*
Wise, Brian David; and Abdallah, Mohammad, 419,162, Cl. D15-9.000.
AdobeAir, Inc.: *See—*
Ciccone, Ted, 419,230, Cl. D23-333.000.
AGCO GmbH & Co.: *See—*
Heiler, Roland; and Epple, Johann, 419,164, Cl. D15-31.000.
Albright, Gerald A.: *See—*
Gaffney, Robert C.; Albright, Gerald A.; Hellenbrand, Ron G.; and Mack, Ross, 419,137, Cl. D13-423.000.
All-Teck Blinds P.T.B. Inc.: *See—*
Cadorette, Mario, 419,022, Cl. D6-580.000.
Allen, David J.; Rush, David R.; and Wallace, Paul T., to Murray, Inc. Design for bicycle frame. 419,110, Cl. D12-111.000.
Allen, David J.; Rush, David R.; and Wallace, Paul T., to Murray, Inc. Bicycle frame. 419,111, Cl. D12-111.000.
Allison, William B.: *See—*
Guspodin, James G.; Himuro, Yasuo; Allison, William B.; and Reep, David M., 419,116, Cl. D12-147.000.
Lassan, Timothy J.; Allison, William B.; and Beauvais, Michel, 419,118, Cl. D12-147.000.
Alltrista Corporation: *See—*
Schuermann, Heiner J., 419,070, Cl. D9-449.000.
Alsons Corporation: *See—*

Ben-Tsur, Gilad, 419,227, Cl. D23-304.000.
Alvimar Manufacturing Co., Inc.: *See—*
Lieberman, Marvin S., 419,207, Cl. D21-549.000.
American Standard Inc.: *See—*
Meda, Alberto, 419,223, Cl. D23-255.000.
Amin, Harish A. Electrode holder. 419,044, Cl. D8-30.000.
Amores, Jorge. License plate. 419,194, Cl. D20-14.000.
Amron, Alan, to Videochip Technology. Motion picture video display device. 419,153, Cl. D14-124.000.
Amway Corporation: *See—*
Mork, Steve O.; Volk, Thomas G.; and Eimerman, Allen C., 419,028, Cl. D7-321.000.
Andrews, Jonathan Neal; Cooper, Stephen Vance; Brink, Gregory Dean; and Burton, David Lynn, to Hewlett-Packard Company. Battery case. 419,131, Cl. D13-103.000.
Antoniello, Frank: *See—*
Warshawsky, Ari Zev; Warshawsky, Jerome; and Antoniello, Frank, 419,220, Cl. D23-252.000.
Apothecary Products, Inc.: *See—*
Priebe, Robert N., 419,237, Cl. D24-130.000.
Armament Systems and Procedures, Inc.: *See—*
Parsons, Kevin L.; Keller, Donald; and Reeves, W. Clay, 419,251, Cl. D26-38.000.
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., to Fairbanks Scales. Scale display. 419,087, Cl. D10-94.000.
Artfarm Umbrella, Inc.: *See—*
Chen, Christine Linmei; and Chen, Michael K., 418,970, Cl. D3-5.000.
Ashida, Kenichiro; and Koshiishi, Kazunori, to Nintendo Co., Ltd. Cartridge for game machine. 419,198, Cl. D21-332.000.
Ashida, Kenichiro, to Nintendo of America Inc. Game machine and disk drive stack. 419,200, Cl. D21-332.000.
Ashida, Kenichiro: *See—*
Cordell, John; and Ashida, Kenichiro, 419,199, Cl. D21-332.000.
Atterklint, Jan Gustav: *See—*
Brorsson, Lena Charlott; Atterklint, Jan Gustav; Sjöqvist, Sven Ingvar; Tuin, Jacobus Nicolaas; and Hansson, Carl-Magnus, 419,056, Cl. D8-499.000.
Avian Adventures, Inc.: *See—*
Frank, Carol E., 419,268, Cl. D30-119.000.
B.C. Cure, Inc.: *See—*
Stech, Clyde G., 419,122, Cl. D12-162.000.
Baker, Bradley William; Kornick, Joseph Michael; and Olivares, Jose Tirso, to Gillette Canada Inc. Toothbrush package. 419,063, Cl. D9-415.000.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., to Lucent Technologies Inc. User interface icon for a display screen of a communications terminal. 419,143, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., to Lucent Technologies Inc. User interface icon for a display screen of a communications terminal. 419,144, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., to Lucent Technologies, Inc. User interface icon for a display screen of a communications terminal. 419,145, Cl. D14-114.100.
Baldwin Hardware Corporation: *See—*
Meck, Leslie A.; and Roberts, Rockwood T., III, 419,256, Cl. D26-67.000.
Ball, Alan D.: *See—*
Haslem, Deborah E.; Ball, Alan D.; and Sears, Charles W., 419,027, Cl. D7-319.000.
Ball Corporation: *See—*
Roth, Marc W.; Conrad, George; and Dawson, Darryl J., 419,058, Cl. D9-307.000.
Bao, Wei Gang, to Golden Bright Manufacturer Ltd. Toy space saucer bubble blower. 419,203, Cl. D21-401.000.
Bao, Wei Gang, to Gold Bright Manufacturer Ltd. Toy space pistol bubble blower. 419,204, Cl. D21-401.000.
Base, Deborah: *See—*
Leveen, Steven; Base, Deborah; and Tedaldi, Denise, 418,997, Cl. D6-429.000.
Batts, Namon B., Jr.; and Brown, Randy M., to Porta-Nails, Inc. Pneumatic nailer. 419,048, Cl. D8-68.000.
Bausch & Lomb Incorporated: *See—*
Brune, Henri, 419,176, Cl. D16-326.000.
Bayer Corporation: *See—*
Doms, Lutz; and Schlagheck, Julian, 419,234, Cl. D24-107.000.
Doms, Lutz; and Schlagheck, Julian, 419,235, Cl. D24-107.000.
Bayerische Motoren Werke Aktiengesellschaft: *See—*
Gabath, Peter, 419,109, Cl. D12-91.000.
Bazillion Products Corporation: *See—*
Sturm, Michael O., 419,034, Cl. D7-628.000.
Beauguitte, Herve Marcel Henri; and Robert, Michel Pierre Charles, to Goodyear Tire & Rubber Company, The. Tire tread. 419,119, Cl. D12-147.000.
Beauvais, Michel: *See—*
Lassan, Timothy J.; Allison, William B.; and Beauvais, Michel, 419,118, Cl. D12-147.000.
Beck, James M.; Stoneberg, Thomas C.; Berge, Gary; Kubitz, Terry; and Tedeschi, Thomas, Jr., to Kraft Foods Inc.; and Creative Packaging Corp. Closure for dispensing nozzle. 419,069, Cl. D9-443.000.
Beckett Corporation: *See—*
Broughton, Steven L., 419,161, Cl. D15-7.000.
Bell, Glenn: *See—*
Lenahan, William R.; Bell, Glenn; and Granata, Joseph, 419,024, Cl. D6-601.000.
Bell Technologies Inc.: *See—*
Shafie, Matt H., 419,083, Cl. D10-79.000.
Ben-Tsur, Gilad, to Alsons Corporation. Slidable shower head holder. 419,227, Cl. D23-304.000.
Berge, Gary: *See—*
Beck, James M.; Stoneberg, Thomas C.; Berge, Gary; Kubitz, Terry; and Tedeschi, Thomas, Jr., 419,069, Cl. D9-443.000.
Bermuda Triangle Golf, LLC: *See—*
Pritchett, Ronnie, 419,213, Cl. D21-744.000.
Bills, Robert A. Trailer hitch lock. 419,121, Cl. D12-162.000.
Binstock, Gary Benjamin; Cummings, Bruce; Kenkare, Divaker; Kinscherf, Kevin Mark; and Phillips, Steve Mark, to Colgate-Palmolive. Detergent tablet. 419,261, Cl. D28-8.100.
Biton, Uzi. Ice cream donut. 418,964, Cl. D1-120.000.
Black & Decker Inc.: *See—*
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.
Streich, John P., 418,977, Cl. D3-273.000.
Blouin, Jean: *See—*
Laporte, Louis; and Blouin, Jean, 419,052, Cl. D8-336.000.
Blumenthal, Martin. Crib. 418,995, Cl. D6-385.000.
Boehringer, John R.; Karpowicz, John; and Hegedus, Michael I., to Boehringer Laboratories, Inc. Gauge. 419,084, Cl. D10-85.000.
Boehringer Laboratories, Inc.: *See—*
Boehringer, John R.; Karpowicz, John; and Hegedus, Michael I., 419,084, Cl. D10-85.000.
Bolin, Loyd. Sliding clutch tool. 419,045, Cl. D8-51.000.
Bolling, Maryann: *See—*
Bolling, William; and Bolling, Maryann, 419,177, Cl. D16-336.000.
Bolling, William; and Bolling, Maryann. Eyeglass clip. 419,177, Cl. D16-336.000.
Bonnett, Eric, to Sara Lee Corporation. Watch. 419,078, Cl. D10-30.000.
Boyce, Robert: *See—*
Croft, Robert; Warner, James; Boyce, Robert; and Enciso, Neil, 419,061, Cl. D9-333.000.
Bradt, Gordon E. Blade for a fan. 419,232, Cl. D23-413.000.
Bridgestone/Firestone, Inc.: *See—*
Guspodin, James G.; Himuro, Yasuo; Allison, William B.; and Reep, David M., 419,116, Cl. D12-147.000.
Bridgestone/Firestone Research, Inc.: *See—*
Lassan, Timothy J.; Allison, William B.; and Beauvais, Michel, 419,118, Cl. D12-147.000.
Brink, Gregory Dean: *See—*
Andrews, Jonathan Neal; Cooper, Stephen Vance; Brink, Gregory Dean; and Burton, David Lynn, 419,131, Cl. D13-103.000.
Brodie, Roly R. Unisex short with reversible condom. 419,233, Cl. D24-105.000.
Brooks, Bruce W.: *See—*
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.
Brorsson, Lena Charlott; Atterklint, Jan Gustav; Sjöqvist, Sven Ingvar; Tuin, Jacobus Nicolaas; and Hansson, Carl-Magnus, to Telefonaktiebolaget LM Ericsson. Locking spring for a connector. 419,056, Cl. D8-499.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Nakamura, Seiji, 419,179, Cl. D18-15.000.
Broughton, Steven L., to Beckett Corporation. Drain pump. 419,161, Cl. D15-7.000.
Brown, David C.: *See—*
Davidson, Steven F.; Vollendorf, Kim D.; DiCicco, Michael F.; Brown, David C.; Gielow, Christopher C.; and Cottingham, David J., 419,160, Cl. D14-253.000.
Brown, Randy M.: *See—*
Batts, Namon B., Jr.; and Brown, Randy M., 419,048, Cl. D8-68.000.
Brune, Henri, to Bausch & Lomb Incorporated. Eyewear. 419,176, Cl. D16-326.000.
Brunner, Bob: *See—*
Evanicky, Daniel E.; Zimmermann, Tina; and Brunner, Bob, 419,141, Cl. D14-113.000.
Bubie, Walter C.: *See—*
Hwang, Hyejung; and Bubie, Walter C., 419,146, Cl. D14-114.300.
Burner, Jack D. Plant support stand. 418,996, Cl. D6-403.000.
Burnett, Brian S.: *See—*
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.
Burton, David Lynn: *See—*
Andrews, Jonathan Neal; Cooper, Stephen Vance; Brink, Gregory Dean; and Burton, David Lynn, 419,131, Cl. D13-103.000.
Cabot Safety Intermediate Corporation: *See—*
Hall, James; Desy, Raoul; and Salce, John, 419,167, Cl. D16-101.000.
Cadorette, Mario, to All-Teck Blinds P.T.B. Inc. Window valance trim element. 419,022, Cl. D6-580.000.
Camino, Mary Lou; and Catalano, Susan J. Canine canteen. 419,271, Cl. D30-152.000.
Canon Kabushiki Kaisha: *See—*

Matsumoto, Hidero, 419,181, Cl. D18-40.000.
Carlson, Bruce W.; and Dubbe, John W., to 3M Innovative Properties Company. Syringe-type applicator. 419,236, Cl. D24-114.000.
Carolina Biological Supply Company: *See—*
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.
Carrier Corporation: *See—*
Stevens, Matthew J.; and Simeone, Robert S., 419,229, Cl. D23-325.000.
Carroll, George H.: *See—*
Indelicato, Len; and Carroll, George H., 419,060, Cl. D9-317.000.
Carsonite International Corporation: *See—*
Joyner, Ernest, III, 419,197, Cl. D20-44.000.
Carter, Leewood C., to Reusable Rolls, Inc. Pallet. 419,275, Cl. D34-38.000.
Cat Eye Co., Ltd.: *See—*
Okuda, Youji, 419,123, Cl. D12-178.000.
Catalano, Susan J.: *See—*
Camino, Mary Lou; and Catalano, Susan J., 419,271, Cl. D30-152.000.
CertainTeed Corporation: *See—*
Hersh, Jeffrey B.; Westphal, Dennis; Opielski, Brian; and Habeck, Jerome C., 419,244, Cl. D25-124.000.
Ceulemans, Jan Antoon. Precious stone. 419,104, Cl. D11-90.000.
Chaney Instrument Co.: *See—*
Folos, Stephen M.; and Walby, Douglas J., 419,090, Cl. D10-101.000.
Chang, Wen-Hsiang. Combined alarm and illuminator for infrared detectors. 419,094, Cl. D10-106.000.
Charriez, Roland; Kristiansen, Keith C.; Van Dyk, Thomas C.; and Williamson, Loreen D., to Schering-Plough Healthcare Products, Inc. Bottle. 419,059, Cl. D9-314.000.
Chen, Christine Linmei; and Chen, Michael K., to Artfarm Umbrella, Inc. Umbrella. 418,970, Cl. D3-5.000.
Chen, Fu-Chang: *See—*
Chen, Fu-Chih, 419,099, Cl. D10-120.000.
Chen, Fu-Chih, to Chen, Fu-Chang. Car horn. 419,099, Cl. D10-120.000.
Chen, Kuo-Chin. Comb. 419,263, Cl. D28-22.000.
Chen, Michael K.: *See—*
Chen, Christine Linmei; and Chen, Michael K., 418,970, Cl. D3-5.000.
Chen, Tzu-Chin, to Tekcon Electronics Corp. Electric connector. 419,134, Cl. D13-146.000.
Cheong, Chow Koh; and Cheong, Yuet Peng, to Sinorita Sendirian Berhad. Toothbrush. 418,981, Cl. D4-104.000.
Cheong, Yuet Peng: *See—*
Cheong, Chow Koh; and Cheong, Yuet Peng, 418,981, Cl. D4-104.000.
Chiu, Terance Chi Ping, to Forexim (H.K.) Limited. Flashlight. 419,254, Cl. D26-49.000.
Choi, Lung Wai, to Goodway Electrical Company Limited. Electric iron. 419,274, Cl. D32-70.000.
Chu, Zooey, to Teknion Furniture Systems Inc. Back for a chair. 419,007, Cl. D6-502.000.
Chuang, Cheng-hua, to Pioneer Industrial Corporation. Building block-type writing implement. 419,187, Cl. D19-36.000.
Chung, Caleb: *See—*
Hampton, David Mark; and Chung, Caleb, 419,209, Cl. D21-658.000.
Ciccone, Ted, to AdobeAir, Inc. Portable evaporative cooler. 419,230, Cl. D23-333.000.
Clarke, Peter Brian, to Playtex Products, Inc. Bottle. 419,074, Cl. D9-523.000.
Clorox Company, The: *See—*
Haslem, Deborah E.; Ball, Alan D.; and Sears, Charles W., 419,027, Cl. D7-319.000.
Cohen, Wendy Michele, to Cohen, Wendy Michele. Set of bride and groom figures for decoration. 419,105, Cl. D11-184.000.
Colgate-Palmolive: *See—*
Binstock, Gary Benjamin; Cummings, Bruce; Kenkare, Divaker; Kinscherf, Kevin Mark; and Phillips, Steve Mark, 419,261, Cl. D28-8.100.
Colgate-Palmolive Company: *See—*
Moskovich, Robert; and Vonarburg, Walter, 418,979, Cl. D4-104.000.
Moskovich, Robert; Vonarburg, Walter; and Waguespack, Kenneth Gerald, 418,980, Cl. D4-104.000.
Collins, Michael T., to Lifetime Products, Inc. Garden bench. 419,004, Cl. D6-492.000.
Conner, Michael P.: *See—*
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., 419,087, Cl. D10-94.000.
Conrad, George: *See—*
Roth, Marc W.; Conrad, George; and Dawson, Darryl J., 419,058, Cl. D9-307.000.
Coons, David R., to DC Athletics, Inc. Portable dock fender. 419,242, Cl. D25-35.000.
Cooper, Grady L. Football practice aid. 419,212, Cl. D21-716.000.
Cooper, Stephen Vance: *See—*
Andrews, Jonathan Neal; Cooper, Stephen Vance; Brink, Gregory Dean; and Burton, David Lynn, 419,131, Cl. D13-103.000.
Copenhaver, Franklin R. Vehicle parking aid. 419,096, Cl. D10-109.000.
Cordell, John; and Ashida, Kenichiro, to Nintendo of America Inc. Game machine and console stack. 419,199, Cl. D21-332.000.
Cosina Co., Ltd.: *See—*
Kato, Takaharu, 419,171, Cl. D16-218.000.
Cottingham, David J.: *See—*
Davidson, Steven F.; Vollendorf, Kim D.; DiCicco, Michael F.; Brown, David C.; Gielow, Christopher C.; and Cottingham, David J., 419,160, Cl. D14-253.000.
Covert, Darrell Edwin: *See—*
Weber, Michael Joseph; Covert, Darrell Edwin; Landers, Samuel Patrick; Miller, Craig David; Freygang, Dale Gustav; and Stroble, James Christopher, 419,114, Cl. D12-143.000.
Crabbe, Bonnie L.: *See—*
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., 419,087, Cl. D10-94.000.
Crabbe, David K.: *See—*
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., 419,087, Cl. D10-94.000.
Creative Packaging Corp.: *See—*
Beck, James M.; Stoneberg, Thomas C.; Berge, Gary; Kubitz, Terry; and Tedeschi, Thomas, Jr., 419,069, Cl. D9-443.000.
Croft, Robert; Warner, James; Boyce, Robert; and Enciso, Neil, to McNeil-PPC, Inc. Bottle. 419,061, Cl. D9-333.000.
Cummings, Bruce: *See—*
Binstock, Gary Benjamin; Cummings, Bruce; Kenkare, Divaker; Kinscherf, Kevin Mark; and Phillips, Steve Mark, 419,261, Cl. D28-8.100.
Cunningham, Lawrie: *See—*
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.
Curwood, Christopher James. Joiner. 419,054, Cl. D8-382.000.
Daenen, Robert H. C. M.: *See—*
Geelen, Jean-Pierre F. M.; and Daenen, Robert H. C. M., 419,031, Cl. D7-395.000.
DaimlerChrysler AG: *See—*
Sacco, Bruno; and Pfeiffer, Peter, 419,124, Cl. D12-196.000.
Sacco, Bruno; and Pfeiffer, Peter, 419,125, Cl. D12-196.000.
Dart Industries Inc.: *See—*
Geelen, Jean-Pierre F. M.; and Daenen, Robert H. C. M., 419,031, Cl. D7-395.000.
Liu, Anita Suk Ping, 419,030, Cl. D7-393.000.
Davi, Leonard A.; and Hagen, R. Sean, to Recoton Corporation. Antenna. 419,159, Cl. D14-230.000.
Davidson, Steven F.; Vollendorf, Kim D.; DiCicco, Michael F.; Brown, David C.; Gielow, Christopher C.; and Cottingham, David J., to Northrop Grumman Corporation. Personal communications unit docking station. 419,160, Cl. D14-253.000.
Daws Manufacturing Co., Inc.: *See—*
Lentini, Robert, 419,066, Cl. D9-423.000.
Dawson, Darryl J.: *See—*
Roth, Marc W.; Conrad, George; and Dawson, Darryl J., 419,058, Cl. D9-307.000.
DC Athletics, Inc.: *See—*
Coons, David R., 419,242, Cl. D25-35.000.
DCI Marketing, Inc.: *See—*
Scungio, Robert A., 418,971, Cl. D3-207.000.
de Haas, Henricus Wilhelmus, to Orion Casino Technology BV. Gambling machine. 419,201, Cl. D21-370.000.
de la Rosa Perez, Luis Bernardo: *See—*
Pratt, Michael Sean; de la Rosa Perez, Luis Bernardo; Miller, Rebecca Ann; and Rice, John Ernest, Jr., 418,983, Cl. D5-53.000.
Demizu, Koji: *See—*
Ishii, Tsutomu; Tanaka, Hiroyuki; and Demizu, Koji, 419,277, Cl. D99-35.000.
Denbur, Inc.: *See—*
Maissami, Fari, 419,238, Cl. D24-152.000.
Desy, Raoul: *See—*
Hall, James; Desy, Raoul; and Salce, John, 419,167, Cl. D16-101.000.
De Vries, Victor Alexander: *See—*
Peters, André François; and De Vries, Victor Alexander, 419,071, Cl. D9-453.000.
DiCicco, Michael F.: *See—*
Davidson, Steven F.; Vollendorf, Kim D.; DiCicco, Michael F.; Brown, David C.; Gielow, Christopher C.; and Cottingham, David J., 419,160, Cl. D14-253.000.
Dickert, Jeffrey: *See—*
Wensley, Martin; and Dickert, Jeffrey, 419,082, Cl. D10-78.000.
Discovery Marketing and Design, Ltd.: *See—*
Scungio, Robert A., 418,971, Cl. D3-207.000.
DN Craft Corporation: *See—*
Kim, Ok-Hwan; and Oh, Wan-Young, 419,178, Cl. D18-15.000.
Doms, Lutz; and Schlagheck, Julian, to Bayer Corporation. Exterior housing for an analytical instrument. 419,234, Cl. D24-107.000.
Doms, Lutz; and Schlagheck, Julian, to Bayer Corporation. Exterior housing for an analytical instrument. 419,235, Cl. D24-107.000.
Doty, Neil: *See—*
Hofer, Michael J.; and Doty, Neil, 419,107, Cl. D12-86.000.
Dow, James C.: *See—*
Khovaylo, Modest; and Dow, James C., 419,140, Cl. D14-107.000.
Dowling, Charles W.; and Reno, Larry J., to Industrias Diza S.A. de C.V. Combined lantern and power source. 419,253, Cl. D26-38.000.
Dubbe, John W.: *See—*
Carlson, Bruce W.; and Dubbe, John W., 419,236, Cl. D24-114.000.
Dudley, Inc.: *See—*

Laporte, Louis; and Blouin, Jean, 419,052, Cl. D8-336.000.
Dull, Lawrence Clifford, to Novartis Crop Protection. Agrochemical bottle. 419,076, Cl. D9-533.000.
du Sartel, Vincent, to Louis Vuitton Malletier, S.A. Handbag. 418,976, Cl. D3-243.000.
Dyke, Colin M.: *See—*
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.
Dyment, James Adam. Automotive arm rest. 419,130, Cl. D12-421.000.
Eastman Kodak Company: *See—*
Hwang, Hyejung; and Bubie, Walter C., 419,146, Cl. D14-114.300.
Ecolab Inc.: *See—*
Klaers, Karen Gail; Russell, Scott T.; and Outlaw, Tina Opal, 419,262, Cl. D28-8.100.
Eimerman, Allen C.: *See—*
Mork, Steve O.; Volk, Thomas G.; and Eimerman, Allen C., 419,028, Cl. D7-321.000.
Elizabeth Arden Co.: *See—*
Jauffret, Christian, 419,073, Cl. D9-520.000.
Elmo Co., Ltd.: *See—*
Hori, Hiromasa; Furusawa, Hiroyuki; and Naruse, Nobuhisa, 419,026, Cl. D6-630.000.
Elms, David C.: *See—*
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., 419,087, Cl. D10-94.000.
Emery, William W.; and Fritts, Russell A. Curved corner caddy set. 419,020, Cl. D6-562.000.
Enciso, Neil: *See—*
Croft, Robert; Warner, James; Boyce, Robert; and Enciso, Neil, 419,061, Cl. D9-333.000.
Englert, Heiner: *See—*
Müller, Wolfgang; and Englert, Heiner, 419,165, Cl. D15-127.000.
Epple, Johann: *See—*
Heiler, Roland; and Epple, Johann, 419,164, Cl. D15-31.000.
Epstein, Judith Susana. Pager carrier. 418,973, Cl. D3-218.000.
Erno, Joseph L.: *See—*
Mackie, Greg C.; and Erno, Joseph L., 419,158, Cl. D14-214.000.
Euro United Corporation: *See—*
Van Rhienen, Alphons, 418,985, Cl. D6-319.000.
Evanicky, Daniel E.; Zimmermann, Tina; and Brunner, Bob, to Silicon Graphics, Inc. Display assembly. 419,141, Cl. D14-113.000.
Evans, Carla Y. Wind chimes. 419,098, Cl. D10-116.000.
Evans, John Joseph, Jr.; Thibodeau, Roger Dennis; Phillips, Wayne Patrick; and Grunstad, Jerome Allan, to L. S. Starrett Company, The. Tape measure. 419,081, Cl. D10-72.000.
Everett, Richard C. Collapsible baby stroller for a jogger. 419,113, Cl. D12-129.000.
Fairbanks Scales: *See—*
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., 419,087, Cl. D10-94.000.
Feldmeier, Daniel R.; and Abbott, Carolyn, to Kraft Foods, Inc. Carton for multiple individually packaged products. 419,062, Cl. D9-346.000.
Flamingo, B.V.: *See—*
Mestrum, Peter J., 419,102, Cl. D11-26.000.
Fluegge, Craig A.; and Hubanks, Brian, to San Jamar, Inc. Paper towel dispenser. 419,014, Cl. D6-522.000.
Folos, Stephen M.; and Walby, Douglas J., to Chaney Instrument Co. Rain gauge. 419,090, Cl. D10-101.000.
Ford, Robert B.; Lyons, Jon H.; Olson, John F.; and Pokorney, William J., to Whelen Engineering Company, Inc. Aerodynamic rear facing light bar for emergency vehicles. 419,249, Cl. D26-28.000.
Forexim (H.K.) Limited: *See—*
Chiu, Terance Chi Ping, 419,254, Cl. D26-49.000.
Foslien, Wayne E.; White, Joseph M.; Ohta, Seiya; and Hartkopf, Gerald L., to Hewlett-Packard Company. Bezel for rack mounted device. 419,148, Cl. D14-115.000.
Foussianes, Nicholas B. Table. 419,003, Cl. D6-487.000.
France, Nicole, to Rubbermaid Incorporated. Sink mat. 419,273, Cl. D32-57.000.
Frank, Carol E., to Avian Adventures, Inc. Top for bird cage. 419,268, Cl. D30-119.000.
Frank, Matthew J., to Williams-Sonoma, Inc. Cookware utensil handle. 419,041, Cl. D7-688.000.
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., to Carolina Biological Supply Company. Microscope. 419,168, Cl. D16-131.000.
Franson, Jeffrey R., to Mikron Industries, Inc. Window component extrusion. 419,245, Cl. D25-124.000.
Franzus Company, Inc.: *See—*
Lenahan, William R.; Bell, Glenn; and Granata, Joseph, 419,024, Cl. D6-601.000.
Freilich, Joseph, to M. Fabrikant & Sons, Ltd. Gem cut. 419,103, Cl. D11-90.000.
Freygang, Dale Gustav: *See—*
Weber, Michael Joseph; Covert, Darrell Edwin; Landers, Samuel Patrick; Miller, Craig David; Freygang, Dale Gustav; and Stroble, James Christopher, 419,114, Cl. D12-143.000.
Friedrich Grohe AG: *See—*
Lobermeier, Hans, 419,221, Cl. D23-254.000.
Müllenmeister, Daniel, 419,218, Cl. D23-238.000.
Fritts, Russell A.: *See—*
Emery, William W.; and Fritts, Russell A., 419,020, Cl. D6-562.000.
Fujii, Toshiro: *See—*
Kojima, Hideyuki; Fujii, Toshiro; Iwata, Shingo; and Saito, Yoshikazu, 419,193, Cl. D20-4.000.
Fujishiro, Mituaki: *See—*
Oguri, Shinichi; and Fujishiro, Mituaki, 418,990, Cl. D6-367.000.
Fujitsu Ltd.: *See—*
Ishii, Tsutomu; Tanaka, Hiroyuki; and Demizu, Koji, 419,277, Cl. D99-35.000.
Furusawa, Hiroyuki: *See—*
Hori, Hiromasa; Furusawa, Hiroyuki; and Naruse, Nobuhisa, 419,026, Cl. D6-630.000.
Gabath, Peter, to Bayerische Motoren Werke Aktiengesellschaft. Surface configuration of a vehicle. 419,109, Cl. D12-91.000.
Gaffney, Robert C.; Albright, Gerald A.; Hellenbrand, Ron G.; and Mack, Ross, to Rayovac Corporation. 9V battery package. 419,137, Cl. D13-423.000.
Galloway, Austra L. Portable beverage bar. 419,000, Cl. D6-481.000.
Gardner, Irene M. Meatball forming press. 419,037, Cl. D7-672.000.
Gavin, Ellen, to L'Oreal S.A. Nail enamel container. 419,075, Cl. D9-529.000.
Geelen, Jean-Pierre F. M.; and Daenen, Robert H. C. M., to Dart Industries Inc. Long handle for cooking vessel. 419,031, Cl. D7-395.000.
Gerlach, Dianne S.: *See—*
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.
Gielow, Christopher C.: *See—*
Davidson, Steven F.; Vollendorf, Kim D.; DiCicco, Michael F.; Brown, David C.; Gielow, Christopher C.; and Cottingham, David J., 419,160, Cl. D14-253.000.
Gilbert, David S.: *See—*
Swensson, Earl S.; and Gilbert, David S., 419,001, Cl. D6-486.000.
Swensson, Earl S.; and Gilbert, David S., 419,002, Cl. D6-486.000.
Gildersleeve, Lynn D. Trailer hitch alignment monitor. 419,092, Cl. D10-104.000.
Gillette Canada Inc.: *See—*
Baker, Bradley William; Kornick, Joseph Michael; and Olivares, Jose Tirso, 419,063, Cl. D9-415.000.
Gillette Company, The: *See—*
Gray, Michael John, 419,265, Cl. D28-48.000.
Gilmore, Benjamin E., to Perrin Manufacturing Company. Combined toilet tissue holder/storage device. 419,011, Cl. D6-519.000.
Ginat, Jonathan, to Global Upholstery Company. Surface treatment for a chair. 419,006, Cl. D6-500.000.
Glassenberg, Marvin. Rack. 418,998, Cl. D6-458.000.
Global Electric Motorcars L.L.C.: *See—*
Hofer, Michael J.; and Doty, Neil, 419,107, Cl. D12-86.000.
Global Upholstery Company: *See—*
Ginat, Jonathan, 419,006, Cl. D6-500.000.
Gobe, Marc, to Gryphon Development. Tube. 419,057, Cl. D9-302.000.
Gobe, Marc, to Gryphon Development. Slim lipstick case. 419,266, Cl. D28-89.000.
Goch, Gregory. Ladder leg extension. 419,243, Cl. D25-68.000.
Gold Bright Manufacturer Ltd.: *See—*
Bao, Wei Gang, 419,204, Cl. D21-401.000.
Gold, Nancy, to Tough Traveler. Backpack. 418,972, Cl. D3-217.000.
Golden Bright Manufacturer Ltd.: *See—*
Bao, Wei Gang, 419,203, Cl. D21-401.000.
Goodway Electrical Company Limited: *See—*
Choi, Lung Wai, 419,274, Cl. D32-70.000.
Goodyear Tire & Rubber Company, The: *See—*
Beauguitte, Herve Marcel Henri; and Robert, Michel Pierre Charles, 419,119, Cl. D12-147.000.
Ratliff, Billy Joe, Jr., 419,117, Cl. D12-147.000.
Weber, Michael Joseph; Covert, Darrell Edwin; Landers, Samuel Patrick; Miller, Craig David; Freygang, Dale Gustav; and Stroble, James Christopher, 419,114, Cl. D12-143.000.
Weber, Michael Joseph; and Reid, Kevin Alan, 419,115, Cl. D12-146.000.
Gorry, Sylvain, to Priva Inc. Packaging. 419,064, Cl. D9-415.000.
Granata, Joseph: *See—*
Lenahan, William R.; Bell, Glenn; and Granata, Joseph, 419,024, Cl. D6-601.000.
Graves, Ben H.: *See—*
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., 419,087, Cl. D10-94.000.
Gray, Michael John, to Gillette Company, The. Gripping element for a razor handle. 419,265, Cl. D28-48.000.
Grimaldi, Joel A. Eyeglass frame. 419,173, Cl. D16-321.000.
Grimaldi, Joel A. Eyeglass frame. 419,174, Cl. D16-321.000.
Grimaldi, Joel A. Eyeglass frame. 419,175, Cl. D16-321.000.
Groupe Guillin (Societe Anonyme): *See—*
Guillin, Francois, 419,067, Cl. D9-430.000.
Gruga U.S.A.: *See—*
McDiarmid, Ronald D., 419,005, Cl. D6-495.000.
Grunstad, Jerome Allan: *See—*

Evans, John Joseph, Jr.; Thibodeau, Roger Dennis; Phillips, Wayne Patrick; and Grunstad, Jerome Allan, 419,081, Cl. D10-72.000.
Gryphon Development: *See*—
Gobe, Marc, 419,057, Cl. D9-302.000.
Gobe, Marc, 419,266, Cl. D28-89.000.
Guillin, Francois, to Groupe Guillin (Societe Anonyme). Food box. 419,067, Cl. D9-430.000.
Guspodin, James G.; Himuro, Yasuo; Allison, William B.; and Reep, David M., to Bridgestone/Firestone, Inc. Tire tread. 419,116, Cl. D12-147.000.
Haas, David J.; and Haas, Sandra, to Temtec, Inc. Laser printable card badge sheet. 419,184, Cl. D19-1.000.
Haas, Sandra: *See*—
Haas, David J.; and Haas, Sandra, 419,184, Cl. D19-1.000.
Habeck, Jerome C.: *See*—
Hersh, Jeffrey B.; Westphal, Dennis; Opielski, Brian; and Habeck, Jerome C., 419,244, Cl. D25-124.000.
Hagen, R. Sean: *See*—
Davi, Leonard A.; and Hagen, R. Sean, 419,159, Cl. D14-230.000.
Hagström, Kjell Ake, to Numéra Idéutveckling AB; and Vitech Sterling of Sweden AB. Pillow set. 419,023, Cl. D6-601.000.
Hall, James; Desy, Raoul; and Saice, John, to Cabot Safety Intermediate Corporation. Eyewear lens. 419,167, Cl. D16-101.000.
Ham, Avah Derderian. Musical note character. 419,208, Cl. D21-627.000.
Hamm, Jack L., to LongBall Sports, Inc. Golf club head with a perforated face and cavity back. 419,214, Cl. D21-750.000.
Hampton, David Mark; and Chung, Caleb, to Tiger Electronics, Ltd. Electronic toy housing. 419,209, Cl. D21-658.000.
Haney, Paul Stephen, to Thomson Consumer Electronics, Inc. Radio. 419,157, Cl. D14-192.000.
Hanover Catalog Holdings, Inc.: *See*—
Rimback, Peter, 419,039, Cl. D7-681.000.
Rimback, Peter, 419,040, Cl. D7-681.000.
Hansen, Brad; and Zupo, Alan L. Bag dispenser. 419,010, Cl. D6-515.000.
Hansson, Carl-Magnus: *See*—
Brorsson, Lena Charlott; Atterklint, Jan Gustav; Sjöqvist, Sven Ingvar; Tuin, Jacobus Nicolaas; and Hansson, Carl-Magnus, 419,056, Cl. D8-499.000.
Harary, Ronnen: *See*—
Kownacki, Charles D.; Rehkemper, Jeffrey G.; and Harary, Ronnen, 419,205, Cl. D21-447.000.
Harman Music Group, Incorporated: *See*—
Holmes, James E., 419,095, Cl. D10-108.000.
Hartge, Henning, to J. S. Staedtler GmbH & Co. Writing instrument. 419,189, Cl. D19-51.000.
Hartkopf, Gerald L.: *See*—
Foslien, Wayne E.; White, Joseph M.; Ohta, Seiya; and Hartkopf, Gerald L., 419,148, Cl. D14-115.000.
Hartmann, Frank R., Jr. Front face of a vehicle wheel. 419,126, Cl. D12-209.000.
Hartunian, Byron V. Sports neck brace. 419,267, Cl. D29-100.000.
Haslem, Deborah E.; Ball, Alan D.; and Sears, Charles W., to Clorox Company, The. Pitcher. 419,027, Cl. D7-319.000.
Havers, James S.: *See*—
Arnold, Gregory J.; Conner, Michael P.; Havers, James S.; Graves, Ben H.; Crabbe, David K.; Elms, David C.; and Crabbe, Bonnie L., 419,087, Cl. D10-94.000.
Hegedus, Michael I.: *See*—
Boehringer, John R.; Karpowicz, John; and Hegedus, Michael I., 419,084, Cl. D10-85.000.
Heiler, Roland; and Epple, Johann, to AGCO GmbH & Co. Hood and grill. 419,164, Cl. D15-31.000.
Heithe, Michael E., to NT Quality Hardware. Flush pull. 419,051, Cl. D8-313.000.
Hellenbrand, Ron G.: *See*—
Gaffney, Robert C.; Albright, Gerald A.; Hellenbrand, Ron G.; and Mack, Ross, 419,137, Cl. D13-423.000.
Herbst, Yaacov T., to Park Media, Ltd. Sign. 419,195, Cl. D20-19.000.
Hersh, Jeffrey B.; Westphal, Dennis; Opielski, Brian; and Habeck, Jerome C., to CertainTeed Corporation. Window component extrusion. 419,244, Cl. D25-124.000.
HEWI Heinrich Wilke GmbH: *See*—
Mahlmann, Veit, 419,017, Cl. D6-523.000.
Hewitt, Laura. Toilet seat handle. 419,228, Cl. D23-311.000.
Hewlett-Packard Company: *See*—
Andrews, Jonathan Neal; Cooper, Stephen Vance; Brink, Gregory Dean; and Burton, David Lynn, 419,131, Cl. D13-103.000.
Foslien, Wayne E.; White, Joseph M.; Ohta, Seiya; and Hartkopf, Gerald L., 419,148, Cl. D14-115.000.
Khovaylo, Modest; and Dow, James C., 419,140, Cl. D14-107.000.
Tanzer, Herbert J; Jupille, Henry; and Poulter, Darrel W, 419,147, Cl. D14-115.000.
Himuro, Yasuo: *See*—
Guspodin, James G.; Himuro, Yasuo; Allison, William B.; and Reep, David M., 419,116, Cl. D12-147.000.
Hofer, Michael J.; and Doty, Neil, to Global Electric Motorcars L.L.C. Multi passenger electric vehicle. 419,107, Cl. D12-86.000.
Holmes, James E., to Harman Music Group, Incorporated. Bezelled light display for a light emitting diodes. 419,095, Cl. D10-108.000.
Hon Hai Precision Ind. Co., Ltd.: *See*—
Wu, Kun-Tsan; and Yang, Fu-Keng, 419,135, Cl. D13-147.000.
Hop Lee Cheong Industrial Company Ltd.: *See*—
Mak, Kai-Shun, 419,190, Cl. D19-52.000.
Hori, Hiromasa; Furusawa, Hiroyuki; and Naruse, Nobuhisa, to Elmo Co., Ltd. Compact disc cabinet. 419,026, Cl. D6-630.000.
Hsu, Hui-Piao. Garden lamp. 419,257, Cl. D26-67.000.
Huang, Te-Ming. Magnet memo clip and pen holder. 419,192, Cl. D19-78.000.
Hubanks, Brian: *See*—
Fluegge, Craig A.; and Hubanks, Brian, 419,014, Cl. D6-522.000.
Hug: *See*—
Hug, Philippe Michel Paul, 419,210, Cl. D21-684.000.
Hug, Philippe Michel Paul, to Hug. Finger exerciser. 419,210, Cl. D21-684.000.
Hukill, Victor J.: *See*—
Nagele, Albert L.; and Hukill, Victor J., 419,155, Cl. D14-138.000.
Humphrey, Neall W., to Trade Source International. Package. 419,065, Cl. D9-418.000.
Hunter, Theodore K. Automotive trim panel clip removing tool. 419,046, Cl. D8-51.000.
Hwang, Hyejung; and Bubie, Walter C., to Eastman Kodak Company. "Select all" icon for a display screen. 419,146, Cl. D14-114.300.
Ide, Masayuki: *See*—
Suzuki, Yoshie; Sunagawa, Yoshitaka; Ide, Masayuki; and Inoue, Toshihiro, 419,132, Cl. D13-104.000.
Iida, Kohichi: *See*—
Saeki, Taisuke; Sakamoto, Harumi; Kurokawa, Seiji; Iida, Kohichi; and Usui, Kiyomi, 419,172, Cl. D16-231.000.
Imai, Toshitaka, to International Business Machines Corporation. Notebook personal computer. 419,138, Cl. D14-106.000.
Indelicato, Len; and Carroll, George H. Fingernail polish bottle. 419,060, Cl. D9-317.000.
Industrias Diza S.A. de C.V.: *See*—
Dowling, Charles W.; and Reno, Larry J., 419,253, Cl. D26-38.000.
Industrie Natuzzi, SPA: *See*—
Natuzzi, Pasquale; and Lucarelli, Raffaella, 418,986, Cl. D6-334.000.
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,991, Cl. D6-381.000.
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,992, Cl. D6-381.000.
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,993, Cl. D6-381.000.
Natuzzi, Pasquale; and Abbruzzese, Domenico, 418,994, Cl. D6-381.000.
Ingersoll-Rand Company: *See*—
Wise, Brian David; and Abdallah, Mohammad, 419,162, Cl. D15-9.000.
Inoue, Toshihiro: *See*—
Suzuki, Yoshie; Sunagawa, Yoshitaka; Ide, Masayuki; and Inoue, Toshihiro, 419,132, Cl. D13-104.000.
International Business Machines Corporation: *See*—
Imai, Toshitaka, 419,138, Cl. D14-106.000.
Ishibashi, Iwao: *See*—
Yoshida, Tooru; and Ishibashi, Iwao, 419,133, Cl. D13-120.000.
Ishii, Tsutomu; Tanaka, Hiroyuki; and Demizu, Koji, to Fujitsu Ltd. Cashless automatic teller machine. 419,277, Cl. D99-35.000.
IW Industries Inc.: *See*—
Warshawsky, Ari Zev; Warshawsky, Jerome; and Antoniello, Frank, 419,220, Cl. D23-252.000.
Iwata, Shingo: *See*—
Kojima, Hideyuki; Fujii, Toshiro; Iwata, Shingo; and Saito, Yoshikazu, 419,193, Cl. D20-4.000.
J. S. Staedtler GmbH & Co.: *See*—
Hartge, Henning, 419,189, Cl. D19-51.000.
Leibeck, Christian, 419,188, Cl. D19-36.000.
Jacquet, Emmanuel, to Manufacture d'Articles de Precision et de Dessin M.A.P.E.D. Scissors. 419,047, Cl. D8-57.000.
James, Daniel E.: *See*—
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.
Jauffret, Christian, to Elizabeth Arden Co. Combined bottle and cap. 419,073, Cl. D9-520.000.
Jehs, Marcus; and Laub, Jürgen, to Nemo S.R.L. Lamp. 419,255, Cl. D26-65.000.
Jeynes, Roger Henry, to Samuel Heath & Sons PLC. Toothbrush holder. 419,018, Cl. D6-534.000.
Johansson, Arne, to A. Johansson Konstruktion AB. Shower and bath tub. 419,225, Cl. D23-280.200.
John Manufacturing Ltd.: *See*—
Kit, Yuen Se, 419,252, Cl. D26-38.000.
Johns, James R. Random number selector. 419,202, Cl. D21-371.000.
Johnson, Claudius D. Match and cigarette box. 419,259, Cl. D27-175.000.
Johnson, Jens. Lollypop holder. 418,963, Cl. D1-105.000.
Joyner, Ernest, III, to Carsonite International Corporation. Curb sign. 419,197, Cl. D20-44.000.
Jupille, Henry: *See*—
Tanzer, Herbert J; Jupille, Henry; and Poulter, Darrel W, 419,147, Cl. D14-115.000.
Kabushiki Kaisha Fuji Iryoki: *See*—
Oguri, Shinichi; and Fujishiro, Mituaki, 418,990, Cl. D6-367.000.
Kabushiki Kaisha Toshiba: *See*—
Kohara, Takashi, 419,139, Cl. D14-107.000.
Karpowicz, John: *See*—
Boehringer, John R.; Karpowicz, John; and Hegedus, Michael I., 419,084, Cl. D10-85.000.

Kato, Takaharu, to Cosina Co., Ltd. Camera. 419,171, Cl. D16-218.000.
Keller, Donald: *See—*
Parsons, Kevin L.; Keller, Donald; and Reeves, W. Clay, 419,251, Cl. D26-38.000.
Kenkare, Divaker: *See—*
Binstock, Gary Benjamin; Cummings, Bruce; Kenkare, Divaker; Kinscherf, Kevin Mark; and Phillips, Steve Mark, 419,261, Cl. D28-8.100.
Kessler, Brian, to Maui Toys, Inc. Light-up ball. 419,247, Cl. D26-1.000.
Khaladj, Faramarz; Khalaj, Steve; and Khalaj, Farhad. Extended axle and stabilizer. 419,120, Cl. D12-160.000.
Khalaj, Farhad: *See—*
Khaladj, Faramarz; Khalaj, Steve; and Khalaj, Farhad, 419,120, Cl. D12-160.000.
Khalaj, Steve: *See—*
Khaladj, Faramarz; Khalaj, Steve; and Khalaj, Farhad, 419,120, Cl. D12-160.000.
Khaled, Chahed. Combined perfume bottle and stand. 419,072, Cl. D9-517.000.
Khovaylo, Modest; and Dow, James C., to Hewlett-Packard Company. Scanner. 419,140, Cl. D14-107.000.
Kilderry, Michael J; Kilderry, Rose R; and McKinzie, Shirley. Vehicle beverage holder. 419,129, Cl. D12-411.000.
Kilderry, Rose R: *See—*
Kilderry, Michael J; Kilderry, Rose R; and McKinzie, Shirley, 419,129, Cl. D12-411.000.
Kim, Kil Ho. Filter for a water purifier. 419,215, Cl. D23-209.000.
Kim, Ok-Hwan; and Oh, Wan-Young, to DN Craft Corporation. Paper impression device. 419,178, Cl. D18-15.000.
Kinscherf, Kevin Mark: *See—*
Binstock, Gary Benjamin; Cummings, Bruce; Kenkare, Divaker; Kinscherf, Kevin Mark; and Phillips, Steve Mark, 419,261, Cl. D28-8.100.
Kit, Yuen Se, to John Manufacturing Ltd. Tool kit lantern. 419,252, Cl. D26-38.000.
Klaers, Karen Gail; Russell, Scott T.; and Outlaw, Tina Opal, to Ecolab Inc. Solid block detergent. 419,262, Cl. D28-8.100.
Knowledge Infrastructure Ltd., The: *See—*
Sivan, Yesha Y., 419,191, Cl. D19-61.000.
Koconis, James Christopher. Picture frame. 418,984, Cl. D6-314.000.
Koedel, Jurgen. Compact disc. 419,151, Cl. D14-121.000.
Kohara, Takashi, to Kabushiki Kaisha Toshiba. Data transfer machine for electronic computers. 419,139, Cl. D14-107.000.
Kojima, Hideyuki; Fujii, Toshiro; Iwata, Shingo; and Saito, Yoshikazu, to Sanyo Electric Co., Ltd. Automatic vending machine for drinks. 419,193, Cl. D20-4.000.
Kon, Miharu: *See—*
Yamauchi, Takanobu; Kubo, Nobuo; and Kon, Miharu, 419,089, Cl. D10-97.000.
Kornick, Joseph Michael: *See—*
Baker, Bradley William; Kornick, Joseph Michael; and Olivares, Jose Tirso, 419,063, Cl. D9-415.000.
Koshiishi, Kazunori: *See—*
Ashida, Kenichiro; and Koshiishi, Kazunori, 419,198, Cl. D21-332.000.
Kownacki, Charles D.; Rehkemper, Jeffrey G.; and Harary, Ronnen, to Spin Master Toys, Ltd. Combined airplane and pumping station. 419,205, Cl. D21-447.000.
Kraft Foods Inc.: *See—*
Beck, James M.; Stoneberg, Thomas C.; Berge, Gary; Kubitz, Terry; and Tedeschi, Thomas, Jr., 419,069, Cl. D9-443.000.
Feldmeier, Daniel R.; and Abbott, Carolyn, 419,062, Cl. D9-346.000.
Krantz, Norman L.; and Stauss, John R., to Zircon Corporation. Front casing portion of hand held scanning tool. 419,149, Cl. D14-116.000.
Kristiansen, Keith C.: *See—*
Charriez, Roland; Kristiansen, Keith C.; Van Dyk, Thomas C.; and Williamson, Loreen D., 419,059, Cl. D9-314.000.
Kubitz, Terry: *See—*
Beck, James M.; Stoneberg, Thomas C.; Berge, Gary; Kubitz, Terry; and Tedeschi, Thomas, Jr., 419,069, Cl. D9-443.000.
Kubo, Nobuo: *See—*
Yamauchi, Takanobu; Kubo, Nobuo; and Kon, Miharu, 419,089, Cl. D10-97.000.
Kurokawa, Seiji: *See—*
Saeki, Taisuke; Sakamoto, Harumi; Kurokawa, Seiji; Iida, Kohichi; and Usui, Kiyomi, 419,172, Cl. D16-231.000.
Kwong, Jackson, to Metro/Thebe, Inc. Colander. 419,036, Cl. D7-667.000.
L. S. Starrett Company, The: *See—*
Evans, John Joseph, Jr.; Thibodeau, Roger Dennis; Phillips, Wayne Patrick; and Grunstad, Jerome Allan, 419,081, Cl. D10-72.000.
La Grouw Holdings Limited: *See—*
Lane, Gerald Thomas; Treloar, Kerry Ronald; La Grouw, Cornelis; and La Grouw, Johannes, Sr., 419,246, Cl. D25-138.000.
La Grouw, Cornelis: *See—*
Lane, Gerald Thomas; Treloar, Kerry Ronald; La Grouw, Cornelis; and La Grouw, Johannes, Sr., 419,246, Cl. D25-138.000.
La Grouw, Johannes, Sr.: *See—*
Lane, Gerald Thomas; Treloar, Kerry Ronald; La Grouw, Cornelis; and La Grouw, Johannes, Sr., 419,246, Cl. D25-138.000.
Lampatz, Holger, to Maxdata Computer GmbH. Monitor buttons. 419,142, Cl. D14-113.000.
Lancer Partnership, Ltd.: *See—*
Mohat, Nicholas, 419,009, Cl. D6-515.000.
Landers, Samuel Patrick: *See—*
Weber, Michael Joseph; Covert, Darrell Edwin; Landers, Samuel Patrick; Miller, Craig David; Freygang, Dale Gustav; and Stroble, James Christopher, 419,114, Cl. D12-143.000.
Lane, Gerald Thomas; Treloar, Kerry Ronald; La Grouw, Cornelis; and La Grouw, Johannes, Sr., to La Grouw Holdings Limited. Building member. 419,246, Cl. D25-138.000.
Lanham, Paul E. Net. 419,211, Cl. D21-705.000.
Laporte, Louis; and Blouin, Jean, to Dudley, Inc. Patio door lock. 419,052, Cl. D8-336.000.
Lassan, Timothy J.; Allison, William B.; and Beauvais, Michel, to Bridgestone/Firestone Research, Inc. Tire tread. 419,118, Cl. D12-147.000.
Laub, Jürgen: *See—*
Jehs, Marcus; and Laub, Jürgen, 419,255, Cl. D26-65.000.
Lay, James Michael: *See—*
Pickard, Paul Kenneth; Lay, James Michael; and Logan, Mark C., 419,097, Cl. D10-114.000.
Lee, Kuo-Jium. Check valve. 419,217, Cl. D23-237.000.
Leibeck, Christian, to J. S. Staedtler GmbH & Co. Combined compass and writing instrument. 419,188, Cl. D19-36.000.
Leick, Paul Anthony. Pacifier and signaling remote control locator set. 419,240, Cl. D24-194.000.
Lenahan, William R.; Bell, Glenn; and Granata, Joseph, to Franzus Company, Inc. Neck cushion. 419,024, Cl. D6-601.000.
Lentini, Robert, to Daws Manufacturing Co., Inc. Locking box with textured surface. 419,066, Cl. D9-423.000.
Leveen, Steven; Base, Deborah; and Tedaldi, Denise, to Levenger Company. Adjustable table. 418,997, Cl. D6-429.000.
Levenger Company: *See—*
Leveen, Steven; Base, Deborah; and Tedaldi, Denise, 418,997, Cl. D6-429.000.
Lewis, Beverly C: *See—*
Lewis, Douglas B. K.; and Lewis, Beverly C, 419,196, Cl. D20-35.000.
Lewis, Douglas B. K.; and Lewis, Beverly C. Fuel tank inlet location indicator. 419,196, Cl. D20-35.000.
Libertyville Saddle Shop Inc.: *See—*
Martin, Jack L., 419,269, Cl. D30-139.000.
Lieberman, Marvin S., to Alvimar Manufacturing Co., Inc. Inflatable race car. 419,207, Cl. D21-549.000.
Lifetime Products, Inc.: *See—*
Collins, Michael T., 419,004, Cl. D6-492.000.
Lin, Hsing Tai. Tool assembly. 419,050, Cl. D8-105.000.
Lindberg, Nafiseh. Ornamental design for a furniture cover. 419,025, Cl. D6-611.000.
Liu, Anita Suk Ping, to Dart Industries Inc. Accessory handle for bowl. 419,030, Cl. D7-393.000.
Livieratos, Christos. Restaurant booth backing. 419,008, Cl. D6-502.000.
Lobermeier, Hans, to Friedrich Grohe AG. Wall-mount handle assembly for a mixing valve. 419,221, Cl. D23-254.000.
Lockwood, John. Water craft. 419,128, Cl. D12-302.000.
Logan, Mark C.: *See—*
Pickard, Paul Kenneth; Lay, James Michael; and Logan, Mark C., 419,097, Cl. D10-114.000.
Lombardi, Laura N.; and Owens, Jeffrey T., to PlaNet Productions, Inc. Automobile. 419,108, Cl. D12-88.000.
LongBall Sports, Inc.: *See—*
Hamm, Jack L., 419,214, Cl. D21-750.000.
Lord, Judd A., to Masco Corporation of Indiana. Faucet with pull-out spray. 419,219, Cl. D23-243.000.
Lord, Judd A., to Masco Corporation of Indiana. High rise faucet with pull-out spray. 419,222, Cl. D23-255.000.
L' Oreal S.A.: *See—*
Gavin, Ellen, 419,075, Cl. D9-529.000.
Louis Baldinger and Sons, Inc.: *See—*
Pfister, Charles, deceased, 419,258, Cl. D26-87.000.
Louis Vuitton Malletier, S.A.: *See—*
du Sartel, Vincent, 418,976, Cl. D3-243.000.
Lowenstein, Rod, to Shape CD, Inc. Compact disk/mini disk. 419,152, Cl. D14-121.000.
Lucarelli, Raffaella: *See—*
Natuzzi, Pasquale; and Lucarelli, Raffaella, 418,986, Cl. D6-334.000.
Lucent Technologies Inc.: *See—*
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,143, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,144, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,145, Cl. D14-114.100.
Lujan, Beverly Ann. Scarf. 418,965, Cl. D2-500.000.
Lutchman, Donald R.: *See—*
Stern, Gary M.; Williams, Charles B., Jr.; and Lutchman, Donald R., 419,032, Cl. D7-515.000.
Lyons, Harold W., to Whelen Engineering Company, Inc. Reflector for a directional warning light. 419,248, Cl. D26-28.000.
Lyons, Jon H.: *See—*
Ford, Robert B.; Lyons, Jon H.; Olson, John F.; and Pokorney, William J., 419,249, Cl. D26-28.000.
M. Fabrikant & Sons, Ltd.: *See—*
Freilich, Joseph, 419,103, Cl. D11-90.000.
M. Kamenstein, Inc.: *See—*
Tisdale, David W., 419,013, Cl. D6-522.000.
Mack, Ross: *See—*

Gaffney, Robert C.; Albright, Gerald A.; Hellenbrand, Ron G.; and Mack, Ross, 419,137, Cl. D13-423.000.

Mackie Designs, Inc.: *See*—
Mackie, Greg C.; and Erno, Joseph L., 419,158, Cl. D14-214.000.

Mackie, Greg C.; and Erno, Joseph L., to Mackie Designs, Inc. Speaker. 419,158, Cl. D14-214.000.

Mahlmann, Veit, to HEWI Heinrich Wilke GmbH. Toilet paper dispenser. 419,017, Cl. D6-523.000.

Maissami, Fari, to Denbur, Inc. Disposable dental applicator handle. 419,238, Cl. D24-152.000.

Mak, Kai-Shun, to Hop Lee Cheong Industrial Company Ltd. Toy drawing board. 419,190, Cl. D19-52.000.

Management Graphics, Inc.: *See*—
Teter, James R.; and Olson, Thor A., 419,185, Cl. D19-1.000.

Manufacture d'Articles de Precision et de Dessin M.A.P.E.D.: *See*—
Jacquet, Emmanuel, 419,047, Cl. D8-57.000.

Manzo, William A., Jr. Cigar humidor. 419,260, Cl. D27-188.000.

Mark, Phillip E. Fluid dropper with cap. 419,068, Cl. D9-436.000.

Markovich, Edward I. Extremity rehabilitation apparatus. 419,239, Cl. D24-188.000.

Marshall, James B. Moisture absorbent sock. 418,969, Cl. D2-980.000.

Martin, Jack L., to Libertyville Saddle Shop Inc. Girth buckle. 419,269, Cl. D30-139.000.

Masano, Koji, to Matsushita Electric Industrial Co., Ltd. Combined video camera with video tape recorder. 419,169, Cl. D16-202.000.

Masco Corporation of Indiana: *See*—
Lord, Judd A., 419,219, Cl. D23-243.000.
Lord, Judd A., 419,222, Cl. D23-255.000.

Matsumoto, Hidero, to Canon Kabushiki Kaisha. Image forming apparatus. 419,181, Cl. D18-40.000.

Matsumoto, Nobuki: *See*—
Tsuda, Kiyonori; and Matsumoto, Nobuki, 419,182, Cl. D18-43.000.

Matsumoto, Takumi: *See*—
Sato, Hideharu; and Matsumoto, Takumi, 419,216, Cl. D23-233.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Masano, Koji, 419,169, Cl. D16-202.000.
Suzuki, Yoshie; Sunagawa, Yoshitaka; Ide, Masayuki; and Inoue, Toshihiro, 419,132, Cl. D13-104.000.

Maui Toys, Inc.: *See*—
Kessler, Brian, 419,247, Cl. D26-1.000.

Maxdata Computer GmbH: *See*—
Lampatz, Holger, 419,142, Cl. D14-113.000.

Maxworld, Inc.: *See*—
Vazquez, Maximino, 418,974, Cl. D3-226.000.

McDiarmid, Ronald D., to Gruga U.S.A. Chair/ottoman base. 419,005, Cl. D6-495.000.

McGee, April Denise: *See*—
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,143, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,144, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,145, Cl. D14-114.100.

McKinzie, Shirley: *See*—
Kilderry, Michael J; Kilderry, Rose R; and McKinzie, Shirley, 419,129, Cl. D12-411.000.

McNeil-PPC, Inc.: *See*—
Croft, Robert; Warner, James; Boyce, Robert; and Enciso, Neil, 419,061, Cl. D9-333.000.

McNerney, Michelle: *See*—
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,143, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,144, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,145, Cl. D14-114.100.

Mead Corporation, The: *See*—
Moor, Marc, 419,186, Cl. D19-27.000.

Meck, Leslie A.; and Roberts, Rockwood T., III, to Baldwin Hardware Corporation. Exterior lantern. 419,256, Cl. D26-67.000.

Meda, Alberto, to American Standard Inc. Faucet spout. 419,223, Cl. D23-255.000.

Megugorac, David. Automobile wheel cover. 419,127, Cl. D12-209.000.

Mestrum, Peter J., to Flamingo, B.V. Ring. 419,102, Cl. D11-26.000.

Metro/Thebe, Inc.: *See*—
Kwong, Jackson, 419,036, Cl. D7-667.000.

Mettler-Toledo GmbH: *See*—
Schmid, Jürgen R., 419,086, Cl. D10-91.000.

Michael Weinig Aktiengesellschaft: *See*—
Müller, Wolfgang; and Englert, Heiner, 419,165, Cl. D15-127.000.

Micro Motion, Inc.: *See*—
Oakley, Nicholas Waddell, 419,088, Cl. D10-96.000.

Middendorf, David A.: *See*—
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.

Mikron Industries, Inc.: *See*—
Franson, Jeffrey R., 419,245, Cl. D25-124.000.

Miller, Craig David: *See*—
Weber, Michael Joseph; Covert, Darrell Edwin; Landers, Samuel Patrick; Miller, Craig David; Freygang, Dale Gustav; and Stroble, James Christopher, 419,114, Cl. D12-143.000.

Miller, Rebecca Ann: *See*—
Pratt, Michael Sean; de la Rosa Perez, Luis Bernardo; Miller, Rebecca Ann; and Rice, John Ernest, Jr., 418,983, Cl. D5-53.000.

Mize, Bobby E.: *See*—
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.

Mohat, Nicholas, to Lancer Partnership, Ltd. Dispensing tower including a detachable merchandiser. 419,009, Cl. D6-515.000.

Mollack, Jean C. Dispensing joint knife. 419,049, Cl. D8-105.000.

Monson, Robert J. Coupling device for construction material. 419,055, Cl. D8-382.000.

Moor, Marc, to Mead Corporation, The. Binder with translucent covers. 419,186, Cl. D19-27.000.

Morgan, Cynthia A.: *See*—
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.

Mork, Steve O; Volk, Thomas G.; and Eimerman, Allen C., to Amway Corporation. Thermal carafe. 419,028, Cl. D7-321.000.

Moskovich, Robert; and Vonarburg, Walter, to Colgate-Palmolive Company. Toothbrush. 418,979, Cl. D4-104.000.

Moskovich, Robert; Vonarburg, Walter; and Waguespack, Kenneth Gerald, to Colgate-Palmolive Company. Toothbrush. 418,980, Cl. D4-104.000.

Motorola, Inc.: *See*—
Nagele, Albert L.; and Hukill, Victor J., 419,155, Cl. D14-138.000.
Page, Michael J.; and Richards, Scott, 419,154, Cl. D14-137.000.

Muir, Roderick D.: *See*—
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.

Müllenmeister, Daniel, to Friedrich Grohe AG. Faucet handle. 419,218, Cl. D23-238.000.

Müller, Wolfgang; and Englert, Heiner, to Michael Weinig Aktiengesellschaft. Woodworking machine. 419,165, Cl. D15-127.000.

Murray, Inc.: *See*—
Allen, David J.; Rush, David R.; and Wallace, Paul T., 419,110, Cl. D12-111.000.
Allen, David J.; Rush, David R.; and Wallace, Paul T., 419,111, Cl. D12-111.000.

Myers, Charles E. Protector for wrist watch lens or the like. 419,101, Cl. D10-132.000.

Nagele, Albert L.; and Hukill, Victor J., to Motorola, Inc. Cellular telephone housing. 419,155, Cl. D14-138.000.

Nakamura, Seiji, to Brother Kogyo Kabushiki Kaisha. Stamp. 419,179, Cl. D18-15.000.

Naruse, Nobuhisa: *See*—
Hori, Hiromasa; Furusawa, Hiroyuki; and Naruse, Nobuhisa, 419,026, Cl. D6-630.000.

Nastasi, Ancela. Handbag. 418,975, Cl. D3-238.000.

Natuzzi, Pasquale; and Lucarelli, Raffaella, to Industrie Natuzzi, SPA. Chair. 418,986, Cl. D6-334.000.

Natuzzi, Pasquale; and Abbruzzese, Domenico, to Industrie Natuzzi,Spa. Seat. 418,991, Cl. D6-381.000.

Natuzzi, Pasquale; and Abbruzzese, Domenico, to Industrie Natuzzi, SPA. Seat. 418,992, Cl. D6-381.000.

Natuzzi, Pasquale; and Abbruzzese, Domenico, to Industrie Natuzzi, SPA. Seat. 418,993, Cl. D6-381.000.

Natuzzi, Pasquale; and Abbruzzese, Domenico, to Industrie Natuzzi, SPA. Seat. 418,994, Cl. D6-381.000.

Nemo S.R.L.: *See*—
Jehs, Marcus; and Laub, Jürgen, 419,255, Cl. D26-65.000.

Nikon Corporation: *See*—
Ono, Arata; and Yanagisawa, Masaaki, 419,170, Cl. D16-208.000.

Nintendo Co., Ltd.: *See*—
Ashida, Kenichiro; and Koshiishi, Kazunori, 419,198, Cl. D21-332.000.

Nintendo of America Inc.: *See*—
Ashida, Kenichiro, 419,200, Cl. D21-332.000.
Cordell, John; and Ashida, Kenichiro, 419,199, Cl. D21-332.000.

Nordström, Martti, to Oy LMP Patents Ltd AB. Apparatus for the removal of oil or grease from a liquid surface. 419,272, Cl. D32-25.000.

Northcott, Donald Owen. Phytoculture micro flow work station. 419,241, Cl. D24-234.000.

Northrop Grumman Corporation: *See*—
Davidson, Steven F.; Vollendorf, Kim D.; DiCicco, Michael F.; Brown, David C.; Gielow, Christopher C.; and Cottingham, David J., 419,160, Cl. D14-253.000.

Novartis Crop Protection: *See*—
Dull, Lawrence Clifford, 419,076, Cl. D9-533.000.

NSI Enterprises, Inc.: *See*—
Pickard, Paul Kenneth; Lay, James Michael; and Logan, Mark C., 419,097, Cl. D10-114.000.

NT Quality Hardware: *See*—
Heithe, Michael E., 419,051, Cl. D8-313.000.

Numéra Idéutveckling AB: *See*—
Hagström, Kjell Ake, 419,023, Cl. D6-601.000.

Oakley, Nicholas Waddell, to Micro Motion, Inc. Coriolis flowmeter housing. 419,088, Cl. D10-96.000.

Oguri, Shinichi; and Fujishiro, Mituaki, to Kabushiki Kaisha Fuji Iryoki. Massage chair. 418,990, Cl. D6-367.000.

Oh, Wan-Young: *See*—
Kim, Ok-Hwan; and Oh, Wan-Young, 419,178, Cl. D18-15.000.

Ohta, Seiya: *See*—
Foslien, Wayne E.; White, Joseph M.; Ohta, Seiya; and Hartkopf, Gerald L., 419,148, Cl. D14-115.000.
Okuda, Youji, to Cat Eye Co., Ltd. Bicycle speedometer bracket attachment bar. 419,123, Cl. D12-178.000.
Olivares, Jose Tirso: *See*—
Baker, Bradley William; Kornick, Joseph Michael; and Olivares, Jose Tirso, 419,063, Cl. D9-415.000.
Olson, John F.: *See*—
Ford, Robert B.; Lyons, Jon H.; Olson, John F.; and Pokorney, William J., 419,249, Cl. D26-28.000.
Olson, Thor A.: *See*—
Teter, James R.; and Olson, Thor A., 419,185, Cl. D19-1.000.
OMRON Corporation: *See*—
Yamauchi, Takanobu; Kubo, Nobuo; and Kon, Miharu, 419,089, Cl. D10-97.000.
Ono, Arata; and Yanagisawa, Masaaki, to Nikon Corporation. Document camera. 419,170, Cl. D16-208.000.
Opielski, Brian: *See*—
Hersh, Jeffrey B.; Westphal, Dennis; Opielski, Brian; and Habeck, Jerome C., 419,244, Cl. D25-124.000.
Orion Casino Technology BV: *See*—
de Haas, Henricus Wilhelmus, 419,201, Cl. D21-370.000.
Oursler, Mark C. Computer mouse. 419,150, Cl. D14-117.300.
Outlaw, Tina Opal: *See*—
Klaers, Karen Gail; Russell, Scott T.; and Outlaw, Tina Opal, 419,262, Cl. D28-8.100.
Owens, Jeffrey T.: *See*—
Lombardi, Laura N.; and Owens, Jeffrey T., 419,108, Cl. D12-88.000.
Owens, Wren M. Patio rail shelf. 419,021, Cl. D6-574.000.
Oy LMP Patents Ltd AB: *See*—
Nordström, Martti, 419,272, Cl. D32-25.000.
Page, Michael J.; and Richards, Scott, to Motorola, Inc. Housing for a portable communications device. 419,154, Cl. D14-137.000.
Panek, Ernest John. Children's home shoe sizer. 419,080, Cl. D10-70.000.
Panton, Verner. Multifunctional furniture. 418,987, Cl. D6-335.000.
Park Media, Ltd.: *See*—
Herbst, Yaacov T., 419,195, Cl. D20-19.000.
Parker, James, to PST Products, Inc. Soft spike for golf shoes. 418,968, Cl. D2-962.000.
Parsons, Kevin L.; Keller, Donald; and Reeves, W. Clay, to Armament Systems and Procedures, Inc. Flashlight. 419,251, Cl. D26-38.000.
Pastore, Richard L.: *See*—
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,143, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,144, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,145, Cl. D14-114.100.
Pattison, Will; and Reed, Jeffrey A., to Rochester Gauges, Inc. Liquid level sender assembly. 419,091, Cl. D10-101.000.
Pennoyer, Raymond P., Jr. Travel case. 418,978, Cl. D3-273.000.
Perrin Manufacturing Company: *See*—
Gilmore, Benjamin E., 419,011, Cl. D6-519.000.
Peters, André François; and De Vries, Victor Alexander, to Sparkle Systems S.A. Cap for pressurized drink bottles. 419,071, Cl. D9-453.000.
Petersen, David: *See*—
Reekie, George; and Petersen, David, 419,093, Cl. D10-106.000.
Pfeiffer, Peter: *See*—
Sacco, Bruno; and Pfeiffer, Peter, 419,124, Cl. D12-196.000.
Sacco, Bruno; and Pfeiffer, Peter, 419,125, Cl. D12-196.000.
Pfister, Charles, deceased (by Jeffrey Weisman, heir), to Louis Baldinger and Sons, Inc. Wall sconce. 419,258, Cl. D26-87.000.
Phillips, Steve Mark: *See*—
Binstock, Gary Benjamin; Cummings, Bruce; Kenkare, Divaker; Kinscherf, Kevin Mark; and Phillips, Steve Mark, 419,261, Cl. D28-8.100.
Phillips, Wayne Patrick: *See*—
Evans, John Joseph, Jr.; Thibodeau, Roger Dennis; Phillips, Wayne Patrick; and Grunstad, Jerome Allan, 419,081, Cl. D10-72.000.
Pickard, Paul Kenneth; Lay, James Michael; and Logan, Mark C., to NSI Enterprises, Inc. Industrial emergency unit light fixture. 419,097, Cl. D10-114.000.
Pioneer Industrial Corporation: *See*—
Chuang, Cheng-hua, 419,187, Cl. D19-36.000.
PlaNet Productions, Inc.: *See*—
Lombardi, Laura N.; and Owens, Jeffrey T., 419,108, Cl. D12-88.000.
Playtex Products, Inc.: *See*—
Clarke, Peter Brian, 419,074, Cl. D9-523.000.
Randolph, Ross Steven, 419,029, Cl. D7-392.000.
Pokorney, William J.: *See*—
Ford, Robert B.; Lyons, Jon H.; Olson, John F.; and Pokorney, William J., 419,249, Cl. D26-28.000.
Porta-Nails, Inc.: *See*—
Batts, Namon B., Jr.; and Brown, Randy M., 419,048, Cl. D8-68.000.
Poulter, Darrel W: *See*—
Tanzer, Herbert J; Jupille, Henry; and Poulter, Darrel W, 419,147, Cl. D14-115.000.
Pratt, Michael Sean; de la Rosa Perez, Luis Bernardo; Miller, Rebecca Ann; and Rice, John Ernest, Jr., to Procter & Gamble Company, The. Pattern for an embossed paper product. 418,983, Cl. D5-53.000.
Price, Steven D. Shrub trimming tarp. 419,042, Cl. D8-1.000.
Priebe, Robert N., to Apothecary Products, Inc. Octagonal syringe holder. 419,237, Cl. D24-130.000.
Pritchett, Ronnie, to Bermuda Triangle Golf, LLC. Golf club head with slot. 419,213, Cl. D21-744.000.
Priva Inc.: *See*—
Gorry, Sylvain, 419,064, Cl. D9-415.000.
Procter & Gamble Company, The: *See*—
Pratt, Michael Sean; de la Rosa Perez, Luis Bernardo; Miller, Rebecca Ann; and Rice, John Ernest, Jr., 418,983, Cl. D5-53.000.
Prus, Robert S. Tire valve stem pressure gauge. 419,085, Cl. D10-86.000.
PST Products, Inc.: *See*—
Parker, James, 418,968, Cl. D2-962.000.
Randolph, Ross Steven, to Playtex Products, Inc. Soft spout for cup. 419,029, Cl. D7-392.000.
Ratliff, Billy Joe, Jr., to Goodyear Tire & Rubber Company, The. Tire tread. 419,117, Cl. D12-147.000.
Rayovac Corporation: *See*—
Gaffney, Robert C.; Albright, Gerald A.; Hellenbrand, Ron G.; and Mack, Ross, 419,137, Cl. D13-423.000.
Recoton Corporation: *See*—
Davi, Leonard A.; and Hagen, R. Sean, 419,159, Cl. D14-230.000.
Reed, Jeffrey A.: *See*—
Pattison, Will; and Reed, Jeffrey A., 419,091, Cl. D10-101.000.
Reekie, George; and Petersen, David. Fire alarm control panel door. 419,093, Cl. D10-106.000.
Reep, David M.: *See*—
Guspodin, James G.; Himuro, Yasuo; Allison, William B.; and Reep, David M., 419,116, Cl. D12-147.000.
Reeves, W. Clay: *See*—
Parsons, Kevin L.; Keller, Donald; and Reeves, W. Clay, 419,251, Cl. D26-38.000.
Rehkemper, Jeffrey G.: *See*—
Kownacki, Charles D.; Rehkemper, Jeffrey G.; and Harary, Ronnen, 419,205, Cl. D21-447.000.
Reichard, David A.: *See*—
Shilling, Jerry L.; Shilling, Michael R.; and Reichard, David A., 418,988, Cl. D6-337.000.
Shilling, Jerry L.; Schilling, Michael R.; and Reichard, David A., 418,989, Cl. D6-337.000.
Reid, Kevin Alan: *See*—
Weber, Michael Joseph; and Reid, Kevin Alan, 419,115, Cl. D12-146.000.
Reno, Larry J.: *See*—
Dowling, Charles W.; and Reno, Larry J., 419,253, Cl. D26-38.000.
Restore, Inc.: *See*—
Sultan, Tim, 419,077, Cl. D9-563.000.
Reusable Rolls, Inc.: *See*—
Carter, Leewood C., 419,275, Cl. D34-38.000.
Rice, John Ernest, Jr.: *See*—
Pratt, Michael Sean; de la Rosa Perez, Luis Bernardo; Miller, Rebecca Ann; and Rice, John Ernest, Jr., 418,983, Cl. D5-53.000.
Richards, Scott: *See*—
Page, Michael J.; and Richards, Scott, 419,154, Cl. D14-137.000.
Ricoh Company, Ltd.: *See*—
Tsuda, Kiyonori; and Matsumoto, Nobuki, 419,182, Cl. D18-43.000.
Rimback, Peter, to Hanover Catalog Holdings, Inc. Ice cream scoop. 419,039, Cl. D7-681.000.
Rimback, Peter, to Hanover Catalog Holdings, Inc. Ice cream scoop handle. 419,040, Cl. D7-681.000.
Robert, Michel Pierre Charles: *See*—
Beauguitte, Herve Marcel Henri; and Robert, Michel Pierre Charles, 419,119, Cl. D12-147.000.
Roberts, Rockwood T., III: *See*—
Meck, Leslie A.; and Roberts, Rockwood T., III, 419,256, Cl. D26-67.000.
Rochester Gauges, Inc.: *See*—
Pattison, Will; and Reed, Jeffrey A., 419,091, Cl. D10-101.000.
Rodkey, Sandra L. Watch bracelet. 419,079, Cl. D10-31.000.
Rosa, Richard P.: *See*—
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.
Roth, Marc W.; Conrad, George; and Dawson, Darryl J., to Ball Corporation. Upper portion of a plastic bottle. 419,058, Cl. D9-307.000.
Rubbermaid Incorporated: *See*—
France, Nicole, 419,273, Cl. D32-57.000.
Ruscitti, Ray S. Magnetic horse blanket. 419,270, Cl. D30-145.000.
Rush, David R.: *See*—
Allen, David J.; Rush, David R.; and Wallace, Paul T., 419,110, Cl. D12-111.000.
Allen, David J.; Rush, David R.; and Wallace, Paul T., 419,111, Cl. D12-111.000.
Russell, Scott T.: *See*—
Klaers, Karen Gail; Russell, Scott T.; and Outlaw, Tina Opal, 419,262, Cl. D28-8.100.
S.E. Tarrerias-Bonjean (S. A.): *See*—
Tarrerias, Eric, 419,035, Cl. D7-649.000.
Sacco, Bruno; and Pfeiffer, Peter, to DaimlerChrysler AG. Surface configuration of a side door panel for a vehicle. 419,124, Cl. D12-196.000.
Sacco, Bruno; and Pfeiffer, Peter, to DaimlerChrysler AG. Surface configuration of a side panel for a vehicle. 419,125, Cl. D12-196.000.
Sadowski, Ara Marie: *See*—

Wallon, Joyce A.; and Sadowski, Ara Marie, 419,264, Cl. D28-25.000.
Saeki, Taisuke; Sakamoto, Harumi; Kurokawa, Seiji; Iida, Kohichi; and Usui, Kiyomi, to Sharp Kabushiki Kaisha. Video projector. 419,172, Cl. D16-231.000.
Saito, Yoshikazu: *See*—
Kojima, Hideyuki; Fujii, Toshiro; Iwata, Shingo; and Saito, Yoshikazu, 419,193, Cl. D20-4.000.
Sakamoto, Harumi: *See*—
Saeki, Taisuke; Sakamoto, Harumi; Kurokawa, Seiji; Iida, Kohichi; and Usui, Kiyomi, 419,172, Cl. D16-231.000.
Salce, John: *See*—
Hall, James; Desy, Raoul; and Salce, John, 419,167, Cl. D16-101.000.
Samuel Heath & Sons PLC: *See*—
Jeynes, Roger Henry, 419,018, Cl. D6-534.000.
San Jamar, Inc.: *See*—
Fluegge, Craig A.; and Hubanks, Brian, 419,014, Cl. D6-522.000.
Sanyo Electric Co., Ltd.: *See*—
Kojima, Hideyuki; Fujii, Toshiro; Iwata, Shingo; and Saito, Yoshikazu, 419,193, Cl. D20-4.000.
Sara Lee Corporation: *See*—
Bonnett, Eric, 419,078, Cl. D10-30.000.
Sato, Hideharu; and Matsumoto, Takumi, to SMC Corporation. Supply and exhaust block for a manifold valve. 419,216, Cl. D23-233.000.
Schering-Plough Healthcare Products, Inc.: *See*—
Charriez, Roland; Kristiansen, Keith C.; Van Dyk, Thomas C.; and Williamson, Loreen D., 419,059, Cl. D9-314.000.
Schilling, Michael R.: *See*—
Shilling, Jerry L.; Schilling, Michael R.; and Reichard, David A., 418,989, Cl. D6-337.000.
Schlack, Richard E., to Southco, Inc. Slide latch. 419,053, Cl. D8-339.000.
Schlagheck, Julian: *See*—
Doms, Lutz; and Schlagheck, Julian, 419,234, Cl. D24-107.000.
Doms, Lutz; and Schlagheck, Julian, 419,235, Cl. D24-107.000.
Schmid, Jürgen R., to Mettler-Toledo GmbH. Compact balance. 419,086, Cl. D10-91.000.
Schuermann, Heiner J., to Alltrista Corporation. Push-pull closure. 419,070, Cl. D9-449.000.
Scott, Stevens H.: *See*—
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.
Scungio, Robert A., to Discovery Marketing and Design, Ltd.; and DCI Marketing, Inc. Key ring holder. 418,971, Cl. D3-207.000.
Sears, Charles W.: *See*—
Haslem, Deborah E.; Ball, Alan D.; and Sears, Charles W., 419,027, Cl. D7-319.000.
Shafie, Matt H., to Bell Technologies Inc. Current probe. 419,083, Cl. D10-79.000.
Shafik, Aasef M. Toilet plunger and brush holder. 419,019, Cl. D6-551.000.
Shape CD, Inc.: *See*—
Lowenstein, Rod, 419,152, Cl. D14-121.000.
Sharp Kabushiki Kaisha: *See*—
Saeki, Taisuke; Sakamoto, Harumi; Kurokawa, Seiji; Iida, Kohichi; and Usui, Kiyomi, 419,172, Cl. D16-231.000.
Shilling, Jerry L.; Shilling, Michael R.; and Reichard, David A., to Wabash Valley Manufacturing, Inc. Design for a table. 418,988, Cl. D6-337.000.
Shilling, Jerry L.; Schilling, Michael R.; and Reichard, David A., to Wabash Valley Manufacturing, Inc. Table. 418,989, Cl. D6-337.000.
Shilling, Michael R.: *See*—
Shilling, Jerry L.; Shilling, Michael R.; and Reichard, David A., 418,988, Cl. D6-337.000.
Shin Yen Enterprise Co., Ltd.: *See*—
Tseng, Chuen-Jong, 418,999, Cl. D6-480.000.
Silicon Graphics, Inc.: *See*—
Evanicky, Daniel E.; Zimmermann, Tina; and Brunner, Bob, 419,141, Cl. D14-113.000.
Simeone, Robert S.: *See*—
Stevens, Matthew J.; and Simeone, Robert S., 419,229, Cl. D23-325.000.
Sinorita Sendirian Berhad: *See*—
Cheong, Chow Koh; and Cheong, Yuet Peng, 418,981, Cl. D4-104.000.
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, to Black & Decker Inc. Mower shroud. 419,163, Cl. D15-14.000.
Sivan, Yesha Y., to Knowledge Infrastructure Ltd., The. Substrate for dynamic map. 419,191, Cl. D19-61.000.
Sjöqvist, Sven Ingvar: *See*—
Brorsson, Lena Charlott; Atterklint, Jan Gustav; Sjöqvist, Sven Ingvar; Tuin, Jacobus Nicolaas; and Hansson, Carl-Magnus, 419,056, Cl. D8-499.000.
SMC Corporation: *See*—
Sato, Hideharu; and Matsumoto, Takumi, 419,216, Cl. D23-233.000.
SMK Co., Ltd.: *See*—
Yoshida, Tooru; and Ishibashi, Iwao, 419,133, Cl. D13-120.000.
SNK Corporation: *See*—
Tomizawa, Masao, 419,136, Cl. D13-147.000.
Sony Corporation: *See*—
Yamazaki, Akira, 419,156, Cl. D14-188.000.
Southco, Inc.: *See*—
Schlack, Richard E., 419,053, Cl. D8-339.000.
Sparkle Systems S.A.: *See*—
Peters, André François; and De Vries, Victor Alexander, 419,071, Cl. D9-453.000.
Spin Master Toys, Ltd.: *See*—
Kownacki, Charles D.; Rehkemper, Jeffrey G.; and Harary, Ronnen, 419,205, Cl. D21-447.000.
Stanley Works, The: *See*—
Staton, John, 419,043, Cl. D8-5.000.
Staton, John, to Stanley Works, The. Pruner. 419,043, Cl. D8-5.000.
Stauss, John R.: *See*—
Krantz, Norman L.; and Stauss, John R., 419,149, Cl. D14-116.000.
Stech, Clyde G., to B.C. Cure, Inc. Vehicle hitch lock. 419,122, Cl. D12-162.000.
Stengel, Ed. Plastic tongue protector. 418,967, Cl. D2-946.000.
Stern, Gary M.; Williams, Charles B., Jr.; and Lutchman, Donald R. Personal computer drinking vessel and holder. 419,032, Cl. D7-515.000.
Stevens, Matthew J.; and Simeone, Robert S., to Carrier Corporation. Cover for a transport refrigeration unit. 419,229, Cl. D23-325.000.
Stoneberg, Thomas C.: *See*—
Beck, James M.; Stoneberg, Thomas C.; Berge, Gary; Kubitz, Terry; and Tedeschi, Thomas, Jr., 419,069, Cl. D9-443.000.
Stouffer Industries, Inc.: *See*—
Stouffer, John D., 419,183, Cl. D18-56.000.
Stouffer, John D., to Stouffer Industries, Inc. Locking hub. 419,183, Cl. D18-56.000.
Streich, John P., to Black & Decker Inc. Tool container. 418,977, Cl. D3-273.000.
Stroble, James Christopher: *See*—
Weber, Michael Joseph; Covert, Darrell Edwin; Landers, Samuel Patrick; Miller, Craig David; Freygang, Dale Gustav; and Stroble, James Christopher, 419,114, Cl. D12-143.000.
Strong, David S.: *See*—
Sirois, Michael G.; Brooks, Bruce W.; Dyke, Colin M.; Muir, Roderick D.; Strong, David S.; Rosa, Richard P.; Burnett, Brian S.; and Cunningham, Lawrie, 419,163, Cl. D15-14.000.
Sturm, Michael O., to Bazillion Products Corporation. Banana hanger. 419,034, Cl. D7-628.000.
Sultan, Tim, to Restore, Inc. Container. 419,077, Cl. D9-563.000.
Sunagawa, Yoshitaka: *See*—
Suzuki, Yoshie; Sunagawa, Yoshitaka; Ide, Masayuki; and Inoue, Toshihiro, 419,132, Cl. D13-104.000.
Suzuki, Yoshie; Sunagawa, Yoshitaka; Ide, Masayuki; and Inoue, Toshihiro, to Matsushita Electric Industrial Co., Ltd. Storage battery. 419,132, Cl. D13-104.000.
Swensson, Earl S.; and Gilbert, David S., to Wellness, LLC. End table. 419,001, Cl. D6-486.000.
Swensson, Earl S.; and Gilbert, David S., to Wellness, LLC. End table. 419,002, Cl. D6-486.000.
Tanaka, Hiroyuki: *See*—
Ishii, Tsutomu; Tanaka, Hiroyuki; and Demizu, Koji, 419,277, Cl. D99-35.000.
Tanzer, Herbert J; Jupille, Henry; and Poulter, Darrel W, to Hewlett-Packard Company. Face plate for data storage enclosure. 419,147, Cl. D14-115.000.
Tarrerias, Éric, to S.E. Tarrerias-Bonjean (S. A.). Kitchen knife. 419,035, Cl. D7-649.000.
Techniquip: *See*—
Wensley, Martin; and Dickert, Jeffrey, 419,082, Cl. D10-78.000.
Tedaldi, Denise: *See*—
Leveen, Steven; Base, Deborah; and Tedaldi, Denise, 418,997, Cl. D6-429.000.
Tedeschi, Thomas, Jr.: *See*—
Beck, James M.; Stoneberg, Thomas C.; Berge, Gary; Kubitz, Terry; and Tedeschi, Thomas, Jr., 419,069, Cl. D9-443.000.
Tekcon Electronics Corp.: *See*—
Chen, Tzu-Chin, 419,134, Cl. D13-146.000.
Teknion Furniture Systems Inc.: *See*—
Chu, Zooey, 419,007, Cl. D6-502.000.
Telefonaktiebolaget LM Ericsson: *See*—
Brorsson, Lena Charlott; Atterklint, Jan Gustav; Sjöqvist, Sven Ingvar; Tuin, Jacobus Nicolaas; and Hansson, Carl-Magnus, 419,056, Cl. D8-499.000.
Temtec, Inc.: *See*—
Haas, David J.; and Haas, Sandra, 419,184, Cl. D19-1.000.
Teter, James R.; and Olson, Thor A., to Management Graphics, Inc. Perforated paper blank for color matching strips. 419,185, Cl. D19-1.000.
Thibodeau, Roger Dennis: *See*—
Evans, John Joseph, Jr.; Thibodeau, Roger Dennis; Phillips, Wayne Patrick; and Grunstad, Jerome Allan, 419,081, Cl. D10-72.000.
Thomas, Lavon. Bread storage container. 419,033, Cl. D7-609.000.
Thomson Consumer Electronics, Inc.: *See*—
Haney, Paul Stephen, 419,157, Cl. D14-192.000.
Tiger Electronics, Ltd.: *See*—
Hampton, David Mark; and Chung, Caleb, 419,209, Cl. D21-658.000.
Tisdale, David W., to M. Kamenstein, Inc. Paper towel holder. 419,013, Cl. D6-522.000.
Tomizawa, Masao, to SNK Corporation. Wireless connector for a hand held game machine. 419,136, Cl. D13-147.000.
Tough Traveler: *See*—
Gold, Nancy, 418,972, Cl. D3-217.000.
Trade Source International: *See*—
Humphrey, Neall W., 419,065, Cl. D9-418.000.
Treloar, Kerry Ronald: *See*—
Lane, Gerald Thomas; Treloar, Kerry Ronald; La Grouw, Cornelis; and La Grouw, Johannes, Sr., 419,246, Cl. D25-138.000.
Trisa Holding, AG: *See*—

Vonarburg, Walter, 418,982, Cl. D4-104.000.
Tseng, Chuen-Jong, to Shin Yen Enterprise Co., Ltd. Desk. 418,999, Cl. D6-480.000.
Tsuda, Kiyonori; and Matsumoto, Nobuki, to Ricoh Company, Ltd. Toner cartridge. 419,182, Cl. D18-43.000.
Tsukineko, Inc.: *See*—
Yasoshima, Rira, 419,180, Cl. D18-17.000.
Tuin, Jacobus Nicolaas: *See*—
Brorsson, Lena Charlott; Atterklint, Jan Gustav; Sjöqvist, Sven Ingvar; Tuin, Jacobus Nicolaas; and Hansson, Carl-Magnus, 419,056, Cl. D8-499.000.
Twitty, Robert L. Bathroom tissue dispenser. 419,016, Cl. D6-523.000.
Uehara, Ryoichiro, to YKK Corporation. Belt adjuster. 419,106, Cl. D11-218.000.
Umemoto, Tom. Portable paper towel dispenser. 419,015, Cl. D6-522.000.
Usui, Kiyomi: *See*—
Saeki, Taisuke; Sakamoto, Harumi; Kurokawa, Seiji; Iida, Kohichi; and Usui, Kiyomi, 419,172, Cl. D16-231.000.
Uvex Arbeitsschutz GmbH: *See*—
Wiedner, Klaus, 419,166, Cl. D16-101.000.
Van Dyk, Thomas C.: *See*—
Charriez, Roland; Kristiansen, Keith C.; Van Dyk, Thomas C.; and Williamson, Loreen D., 419,059, Cl. D9-314.000.
Van Rhienen, Alphons, to Euro United Corporation. Coat hanger. 418,985, Cl. D6-319.000.
Vazquez, Maximino, to Maxworld, Inc. Compacted carry bag. 418,974, Cl. D3-226.000.
Videochip Technology: *See*—
Amron, Alan, 419,153, Cl. D14-124.000.
Vitech Sterling of Sweden AB: *See*—
Hagström, Kjell Ake, 419,023, Cl. D6-601.000.
Volk, Thomas G.: *See*—
Mork, Steve O.; Volk, Thomas G.; and Eimerman, Allen C., 419,028, Cl. D7-321.000.
Vollendorf, Kim D.: *See*—
Davidson, Steven F.; Vollendorf, Kim D.; DiCicco, Michael F.; Brown, David C.; Gielow, Christopher C.; and Cottingham, David J., 419,160, Cl. D14-253.000.
Vonarburg, Walter, to Trisa Holding, AG. Toothbrush. 418,982, Cl. D4-104.000.
Vonarburg, Walter: *See*—
Moskovich, Robert; and Vonarburg, Walter, 418,979, Cl. D4-104.000.
Moskovich, Robert; Vonarburg, Walter; and Waguespack, Kenneth Gerald, 418,980, Cl. D4-104.000.
Wabash Valley Manufacturing, Inc.: *See*—
Shilling, Jerry L.; Shilling, Michael R.; and Reichard, David A., 418,988, Cl. D6-337.000.
Shilling, Jerry L.; Schilling, Michael R.; and Reichard, David A., 418,989, Cl. D6-337.000.
Waguespack, Kenneth Gerald: *See*—
Moskovich, Robert; Vonarburg, Walter; and Waguespack, Kenneth Gerald, 418,980, Cl. D4-104.000.
Wah Hing Toys Development Co., Ltd.: *See*—
Wei, Kam Wah, 419,206, Cl. D21-483.000.
Walby, Douglas J.: *See*—
Folos, Stephen M.; and Walby, Douglas J., 419,090, Cl. D10-101.000.
Wallace, Paul T.: *See*—
Allen, David J.; Rush, David R.; and Wallace, Paul T., 419,110, Cl. D12-111.000.
Allen, David J.; Rush, David R.; and Wallace, Paul T., 419,111, Cl. D12-111.000.
Wallon, Joyce A.; and Sadowski, Ara Marie. Combination hair ornament and retaining combs. 419,264, Cl. D28-25.000.
Walsh, Daniel. Sports undergarment. 418,966, Cl. D2-712.000.
Warner, James: *See*—
Croft, Robert; Warner, James; Boyce, Robert; and Enciso, Neil, 419,061, Cl. D9-333.000.
Warshawsky, Ari Zev; Warshawsky, Jerome; and Antoniello, Frank, to IW Industries Inc. Lavatory handle. 419,220, Cl. D23-252.000.
Warshawsky, Jerome: *See*—
Warshawsky, Ari Zev; Warshawsky, Jerome; and Antoniello, Frank, 419,220, Cl. D23-252.000.
Weber, Michael Joseph; Covert, Darrell Edwin; Landers, Samuel Patrick; Miller, Craig David; Freygang, Dale Gustav; and Stroble, James Christopher, to Goodyear Tire & Rubber Company, The. Tire tread. 419,114, Cl. D12-143.000.
Weber, Michael Joseph; and Reid, Kevin Alan, to Goodyear Tire & Rubber Company, The. Tire tread. 419,115, Cl. D12-146.000.
Wei, Kam Wah, to Wah Hing Toys Development Co., Ltd. Toy cake. 419,206, Cl. D21-483.000.
Weibel, Hans, to Zyliss Haushaltwaren AG. Condiment mill. 419,038, Cl. D7-679.000.
Weisman, Jeffrey, heir: *See*—
Pfister, Charles, deceased, 419,258, Cl. D26-87.000.
Wellness, LLC: *See*—
Swensson, Earl S.; and Gilbert, David S., 419,001, Cl. D6-486.000.
Swensson, Earl S.; and Gilbert, David S., 419,002, Cl. D6-486.000.
Wells, Robin S.: *See*—
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,143, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,144, Cl. D14-114.100.
Baker, Stephen Andrew; McGee, April Denise; McNerney, Michelle; Pastore, Richard L.; and Wells, Robin S., 419,145, Cl. D14-114.100.
Wensley, Martin; and Dickert, Jeffrey, to Techniquip. Refractometric analyzer. 419,082, Cl. D10-78.000.
Westphal, Dennis: *See*—
Hersh, Jeffrey B.; Westphal, Dennis; Opielski, Brian; and Habeck, Jerome C., 419,244, Cl. D25-124.000.
Whelen Engineering Company, Inc.: *See*—
Ford, Robert B.; Lyons, Jon H.; Olson, John F.; and Pokorney, William J., 419,249, Cl. D26-28.000.
Lyons, Harold W., 419,248, Cl. D26-28.000.
White, Joseph M.: *See*—
Foslien, Wayne E.; White, Joseph M.; Ohta, Seiya; and Hartkopf, Gerald L., 419,148, Cl. D14-115.000.
Wiedner, Klaus, to Uvex Arbeitsschutz GmbH. Lens for protective eyeglasses. 419,166, Cl. D16-101.000.
WiggCo Designs LLC: *See*—
Wiggins, Leroy, Jr., 419,012, Cl. D6-520.000.
Wiggins, Leroy, Jr., to WiggCo Designs LLC. Illuminated toilet paper holder. 419,012, Cl. D6-520.000.
Williams, Charles B., Jr.: *See*—
Stern, Gary M.; Williams, Charles B., Jr.; and Lutchman, Donald R., 419,032, Cl. D7-515.000.
Williams-Sonoma, Inc.: *See*—
Frank, Matthew J., 419,041, Cl. D7-688.000.
Williamson, Loreen D.: *See*—
Charriez, Roland; Kristiansen, Keith C.; Van Dyk, Thomas C.; and Williamson, Loreen D., 419,059, Cl. D9-314.000.
Wirbelauer, Klaus: *See*—
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.
Wise, Brian David; and Abdallah, Mohammad, to Ingersoll-Rand Company. Reciprocating compressor. 419,162, Cl. D15-9.000.
Wofford, Gina C.: *See*—
Franks, Richard L.; Gerlach, Dianne S.; James, Daniel E.; Middendorf, David A.; Mize, Bobby E.; Morgan, Cynthia A.; Scott, Stevens H.; Wirbelauer, Klaus; and Wofford, Gina C., 419,168, Cl. D16-131.000.
Wu, Kun-Tsan; and Yang, Fu-Keng, to Hon Hai Precision Ind. Co., Ltd. Electrical connector. 419,135, Cl. D13-147.000.
Yamauchi, Takanobu; Kubo, Nobuo; and Kon, Miharu, to OMRON Corporation. Body fat monitor. 419,089, Cl. D10-97.000.
Yamazaki, Akira, to Sony Corporation. Amplifier. 419,156, Cl. D14-188.000.
Yanagisawa, Masaaki: *See*—
Ono, Arata; and Yanagisawa, Masaaki, 419,170, Cl. D16-208.000.
Yang, Fu-Keng: *See*—
Wu, Kun-Tsan; and Yang, Fu-Keng, 419,135, Cl. D13-147.000.
Yasoshima, Rira, to Tsukineko, Inc. Stamp pad container. 419,180, Cl. D18-17.000.
Yeh, Neng-Chen. Lamp. 419,250, Cl. D26-28.000.
YKK Corporation: *See*—
Uehara, Ryoichiro, 419,106, Cl. D11-218.000.
Yoshida, Tooru; and Ishibashi, Iwao, to SMK Co., Ltd. Connector for a battery. 419,133, Cl. D13-120.000.
Yu, Hyun Bok. Commode seat for an infant. 419,226, Cl. D23-296.000.
Zimmermann, Tina: *See*—
Evanicky, Daniel E.; Zimmermann, Tina; and Brunner, Bob, 419,141, Cl. D14-113.000.
Zircon Corporation. *See*—
Krantz, Norman L.; and Stauss, John R., 419,149, Cl. D14-116.000.
Zito, Richard R. Metric/American adapter. 419,224, Cl. D23-262.000.
Zito, Richard R. High pressure liquid CO_2 filter. 419,231, Cl. D23-365.000.
Zupo, Alan L.: *See*—
Hansen, Brad; and Zupo, Alan L., 419,010, Cl. D6-515.000.
Zyliss Haushaltwaren AG: *See*—
Weibel, Hans, 419,038, Cl. D7-679.000.
3M Innovative Properties Company: *See*—
Carlson, Bruce W.; and Dubbe, John W., 419,236, Cl. D24-114.000.

LIST OF PLANT PATENTEES

Delbard, Guy, to Société Anonyme des Pépiniéres et Roseraies Georges Delbard. Hybrid tea rose plant named 'Delverbla'. 11,184, Cl. Plt.-133.000.

Izhar, Shamai: *See*—

Izsak, Eva; and Izhar, Shamai, 11,183, Cl. Plt.-208.000.

Izsak, Eva; and Izhar, Shamai, to State of Israel, Ministry of Agriculture, Agricultural Research Organization. Strawberry plant named 'Yael'. 11,183, Cl. Plt.-208.000.

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Société Anonyme des Pépiniéres et Roseraies Georges Delbard: *See*—

Delbard, Guy, 11,184, Cl. Plt.-133.000.

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Izsak, Eva; and Izhar, Shamai, 11,183, Cl. Plt.-208.000.

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CLASSIFICATION OF PATENTS

ISSUED JANUARY 18, 2000

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

6.1 6,014,769
18 6,014,770
23 6,014,771
69 6,014,772
6,014,773
158 6,014,774
161.2 6,014,775
207 6,014,776
400 6,014,777

CLASS 4

502 6,014,778
583 6,014,779
613 6,014,780

CLASS 5

99.1 6,014,781
499 6,014,782
618 6,014,783
713 6,014,784

CLASS 7

105 6,014,785
118 6,014,786
128 6,014,787

CLASS 8

549 6,015,439

CLASS 15

104.002 6,014,788
104.063 6,014,789
304 6,014,790
327.1 6,014,791

CLASS 24

20 R 6,014,792
265 B 6,014,793
300 6,014,794
400 6,014,795
633 6,014,796

CLASS 28

146 6,014,797

CLASS 29

2 6,014,798
25.35 6,014,799
25.41 6,014,800
243.525 6,014,801
407.01 6,014,802
623 6,014,803
715 6,014,804
852 6,014,805
893.33 6,014,806
893.37 6,014,807
6,014,808
896 6,014,809

CLASS 30

92 6,014,810
124 6,014,811
276 6,014,812
391 6,014,813

CLASS 33

228 6,014,814
287 6,014,815
503 6,014,816

CLASS 34

60 6,014,817
273 6,014,818
396 6,014,819
548 6,014,820

CLASS 36

8.1 6,014,821
10 6,014,822
93 6,014,823
103 6,014,824

CLASS 37

91 6,014,825
456 6,014,826

CLASS 38

104 6,014,827

CLASS 40

492 6,014,828
753 6,014,829

CLASS 42

100 6,014,830

CLASS 43

25.2 6,014,831
44.99 6,014,832
54.1 6,014,833
131 6,014,834

CLASS 44

388 6,015,440
393 6,015,441

CLASS 47

1.44 6,014,835
1.5 6,014,836
31 6,014,837
65 6,014,838

CLASS 49

74.1 6,014,839
413 6,014,840

CLASS 51

309 6,015,442

CLASS 52

19 6,014,841
79.12 6,014,842
167.3 6,014,843
173.2 6,014,844
200 RE. 36,496
6,014,845
204.1 6,014,846
311.1 6,014,847
396.04 6,014,848
586.1 6,014,849

CLASS 53

134.1 6,014,850
430 6,014,851
465 6,014,852

CLASS 55

302 6,015,443
320 6,015,444

CLASS 56

27.5 6,014,853

CLASS 57

290 6,014,854

CLASS 60

39.02 RE. 36,497
39.06 6,014,855
39.12 6,014,856
251 6,014,857
274 6,014,858
285 6,014,859
286 6,014,860
487 6,014,861
533 6,014,862
653 6,014,863

CLASS 62

51.1 6,014,864
151 6,014,865
201 6,014,866
255 6,014,867
407 6,014,868
621 6,014,869

CLASS 63

13 6,014,870
41 6,014,871

CLASS 65

58 6,014,872
104 6,014,873

CLASS 66

106 6,014,874
220 6,014,875

CLASS 70

240 6,014,876
371 6,014,877
472 6,014,878

CLASS 71

28 6,015,445

CLASS 72

61 6,014,879
181 6,014,880
201 6,014,881
229 6,014,882
347 6,014,883
369 6,014,884
453.16 6,014,885

CLASS 73

1.81 6,014,886
12.04 6,014,887
23.35 6,014,888
24.01 6,014,889
29.02 6,014,890
40 6,014,891
40.7 6,014,892
49.7 6,014,893
61.43 6,014,894
382 R 6,014,895
514.16 RE. 36,498
583 6,014,896
628 6,014,897
642 6,014,898
664 6,014,899
781 6,014,900
831 6,014,901
861.12 6,014,902
861.73 6,014,903
865.5 6,014,904
866.3 6,014,905

CLASS 74

89.15 6,014,906
395 6,014,907
471 R 6,014,908
490.02 6,014,909
502.6 6,014,910
572 6,014,911
574 6,014,912
594.1 6,014,913
594.6 6,014,914
606 R 6,014,915
650 6,014,916

CLASS 75

243 6,015,446
255 6,015,447
560 6,015,448
599 6,015,449

CLASS 81

355 6,014,917

CLASS 83

13 6,014,918
282 6,014,919
560 6,014,920
862 6,014,921

CLASS 84

313 6,015,945
380 R 6,015,946
471 R 6,015,947
484 6,015,948
613 6,015,949

CLASS 89

1.11 6,014,922
127 6,014,923

CLASS 92

13.5 6,014,924

CLASS 95

139 6,015,450
184 6,015,451
287 6,015,452

CLASS 96

195 6,015,453

CLASS 99

327 6,014,925
487 6,014,926

CLASS 100

212 6,014,927

CLASS 101

128.21 6,014,928
456 6,014,929
6,014,930
465 6,014,931

CLASS 102

200 6,014,932
312 6,014,933

CLASS 105

26.05 6,014,934

CLASS 106

31.47 6,015,454
31.58 6,015,455
286.5 6,015,456
287.16 6,015,457
498 6,015,458

CLASS 108

90 6,014,935
167 6,014,936

CLASS 112

80.41 6,014,937
470.18 6,014,938

CLASS 114

230.12 6,014,939
271 6,014,940

CLASS 116

63 R 6,014,941
309 6,014,942

CLASS 117

2 6,015,459
217 6,015,460
218 6,015,461

CLASS 118

668 6,015,462
715 6,015,463
6,015,464
719 6,015,465
723 E 6,014,943
723 R 6,014,944

CLASS 119

14.01 6,014,945
162 6,014,946
171 6,014,947
449 6,014,948
484 6,014,949
710 6,014,950
712 6,014,951

CLASS 123

90.12 RE. 36,499
90.17 6,014,952
193.4 RE. 36,500
246 6,014,953
339.13 6,014,954
399 6,014,955
446 6,014,956
509 6,014,957
520 6,014,958
568.19 6,014,959
568.2 6,014,960
568.21 6,014,961
674 6,014,962
6,014,963

CLASS 124

6 6,014,964

CLASS 125

12 6,014,965

CLASS 126

110 R 6,014,966
592 6,014,967
639 6,014,968

CLASS 127

30 6,015,466

CLASS 128

200.14 6,014,969
200.16 6,014,970
201.25 6,014,971
203.12 6,014,972
897 6,014,973

CLASS 131

185 6,014,974

CLASS 132

200 6,014,975
232 6,014,976
6,014,977
293 6,014,978

CLASS 134

1 6,015,467
1.1 6,014,979

CLASS 135

20.1 6,014,980
67 6,014,981
124 6,014,982

CLASS 136

246 6,015,950
257 6,015,951

CLASS 137

312 6,014,983
315 6,014,984
359 6,014,985
526 6,014,986
549 6,014,987

CLASS 138

168 6,014,988

CLASS 139

88 6,014,989
194 6,014,990
370.2 6,014,991
435.1 6,014,992

CLASS 140

105 6,014,993

CLASS 141

89 6,014,994
231 6,014,995

CLASS 144

334 6,014,996

CLASS 152

151 6,014,997
564 6,014,998

CLASS 156

129 6,015,468
147 RE. 36,501
230 6,015,469
267 6,015,470
274.4 6,015,471
290 6,015,472
293 6,015,473
314 6,015,474
331.4 6,015,475
345 6,015,476
512 6,014,999
539 6,015,000

CLASS 160

115 6,015,001
168.1 R 6,015,002
201 6,015,003
349.1 6,015,004

CLASS 164

170 6,015,005
416 6,015,006
456 6,015,007

CLASS 165

185 6,015,008

CLASS 166

89.3 6,015,009
249 6,015,010
265 6,015,011
313 6,015,012
360 6,015,013
374 6,015,014
384 6,015,015

CLASS 172

677 6,015,016

CLASS 173

48 6,015,017

CLASS 174

72 R 6,015,952
79 6,015,953
102 R B1 574,260
110 R 6,015,954
260 6,015,955

CLASS 175

57 6,015,018

CLASS 180

53.2 6,015,019
197 6,015,020
206 6,015,021
210 6,015,022
446 6,015,023

CLASS 181

131 6,015,024
199 6,015,025
295 6,015,026

CLASS 182

70 6,015,027
136 6,015,028

CLASS 184

106 6,015,029

CLASS 188

266.2 6,015,030

CLASS 192

3.58 6,015,031
14 6,015,032
35 RE. 36,502
53.36 6,015,033
69.8 6,015,034
107 C 6,015,035
217 6,015,036

CLASS 194

318 6,015,037

CLASS 198

322 6,015,038
368 6,015,039
438 6,015,040

CLASS 200

43.14 6,015,956
244 6,015,957
330 6,015,958
400 6,015,959

CLASS 203

13 6,015,477

CLASS 204

192.13 6,015,478
412 6,015,479
418 6,015,480
419 6,015,481

CLASS 205

125 6,015,482
763 6,015,483
775.5 6,015,484

CLASS 206

0.7 6,015,041
63.3 6,015,042
446 6,015,043
460 6,015,044
494 6,015,045
511 6,015,046
522 6,015,047

CLASS 208

112 6,015,485

CLASS 209

143 6,015,048
675 6,015,049

CLASS 210

87 6,015,486
90 6,015,487
123 6,015,488
131 6,015,489
151 6,015,490
198.2 6,015,491
238 6,015,492
252 6,015,493
299 6,015,494
500.38 6,015,495
603 6,015,496
618 6,015,497
688 6,015,498
767 6,015,499
6,015,500
776 6,015,501
793 6,015,502

CLASS 211

40 6,015,050
59.3 6,015,051
187 6,015,052
188 6,015,053

CLASS 215

252 6,015,054

CLASS 216

66 6,015,503

CLASS 218

43 6,015,960

CLASS 219

69.15 6,015,961
98 6,015,962
121.52 6,015,963
130.33 6,015,964
213 6,015,965
388 6,015,966
519 6,015,967
687 6,015,968

CLASS 220

1.5 6,015,055
6 6,015,056
9.2 6,015,057
229 6,015,058
258 6,015,059
269 6,015,060
287 6,015,061
295 6,015,062
495.04 6,015,063
524 6,015,064
586 6,015,065

CLASS 222

64 6,015,066
153.13 6,015,067
400.7 6,015,068

CLASS 223

37 6,015,069
46 6,015,070

CLASS 224

42.34 6,015,071
153 6,015,072
251 6,015,073
310 6,015,074
321 6,015,075
637 6,015,076
666 6,015,077

CLASS 227

10 6,015,078

CLASS 228

4.1 6,015,079
158 6,015,080
180.22 6,015,081
6,015,082
254 6,015,083

CLASS 229

122.32 6,015,084
305 6,015,085

CLASS 231

2.5 6,015,086

CLASS 235

379 6,015,087
462.01 6,015,088
462.16 6,015,089
472 6,015,090
472.01 6,015,091
486 6,015,092
492 6,015,093

CLASS 239

44 6,015,094
71 6,015,095
73 6,015,096
164 6,015,097
261 6,015,098
266 6,015,099
428.5 6,015,100
455 6,015,101
542 6,015,102
585.4 6,015,103

CLASS 241

20 6,015,104
30 6,015,105
69 6,015,106
101.2 6,015,107
101.73 6,015,108

CLASS 242

364.7 6,015,109
388.1 6,015,110
394 6,015,111
397.5 6,015,112
474.5 6,015,113
559.2 6,015,114

CLASS 244

123 6,015,115
169 6,015,116
214 6,015,117

CLASS 248

65 6,015,118
6,015,119
123.11 6,015,120
150 6,015,121
156 6,015,122
220.1 6,015,123
220.31 6,015,124
231.9 6,015,125
289.11 6,015,126
339 6,015,127
421 6,015,128
444 6,015,129
631 6,015,130
638 6,015,131
683 6,015,132

CLASS 250

208.1 RE. 36,503
227.27 6,015,969
229 6,015,970
231.13 6,015,971
282 6,015,972
305 6,015,973
368 6,015,974
492.22 6,015,975
492.23 6,015,976

CLASS 251

30.01 6,015,133
61.4 6,015,134

CLASS 252

8.91 6,015,504
79.2 6,015,505
186.1 6,015,506
299.01 6,015,507
299.63 6,015,508
500 6,015,509
609 6,015,510

CLASS 254

1 6,015,135
18 6,015,136
323 6,015,137

CLASS 256

65 6,015,138
6,015,139

CLASS 257

4 6,015,977
25 6,015,978
86 6,015,979
99 6,015,980
194 6,015,981
262 6,015,982
296 6,015,983
298 6,015,984
301 6,015,985
303 6,015,986
6,015,987
308 6,015,988
309 6,015,989
310 6,015,990
336 6,015,991
350 6,015,992
355 6,015,993
380 6,015,994
390 6,015,995
393 6,015,996
412 6,015,997
446 6,015,998
497 6,015,999
522 6,016,000
530 6,016,001
546 6,016,002
666 6,016,003
676 6,016,004
703 6,016,005
712 6,016,006
714 6,016,007
751 6,016,008
763 6,016,009
764 6,016,010
773 6,016,011
775 6,016,012
778 6,016,013

CLASS 261

36.1 6,015,140

CLASS 264

1.7 6,015,511
2.2 6,015,512
37.18 6,015,513
40.1 6,015,514
6,015,515
41 6,015,516
44 6,015,517
69 6,015,518
74 6,015,519
104 6,015,520
105 6,015,521
6,015,522
129 6,015,523
173.12 6,015,524
315 6,015,525

CLASS 266

108 6,015,526
145 6,015,527
207 6,015,528

CLASS 267

140.12 6,015,141
154 6,015,142

CLASS 271

4.1 6,015,143
97 6,015,144
98 6,015,145
6,015,146
163 6,015,147
164 6,015,148

CLASS 273

148 A 6,015,149
157 R 6,015,150
317 6,015,151

CLASS 277

321 6,015,152
412 6,015,153

CLASS 279

2.07 6,015,154

CLASS 280

5.505 6,015,155
11.22 6,015,156
11.27 6,015,157
124.163 6,015,158
238 6,015,159
288.4 6,015,160
626 6,015,161
735 6,015,162
6,015,163
806 6,015,164
824 6,015,165

CLASS 281

42 6,015,166

CLASS 283

67 6,015,167

CLASS 285

81 6,015,168
136.1 6,015,169
223 6,015,170
362 6,015,171

CLASS 289

2 6,015,172

CLASS 290

55 6,016,014
6,016,015

CLASS 292

288 6,015,173

CLASS 294

2 6,015,174
65.5 6,015,175

CLASS 296

35.1 6,015,176
37.6 6,015,177
39.2 6,015,178
57.1 6,015,179
95.1 6,015,180
145 6,015,181
146.6 6,015,182
204 6,015,183
219 6,015,184

CLASS 297

59 6,015,185
67 6,015,186
300.4 6,015,187
344.21 6,015,188
353 6,015,189
378.1 6,015,190

CLASS 298

23 D 6,015,191

CLASS 303

140 6,015,192
147 6,015,193
155 6,015,194

CLASS 307

9.1 6,016,016
64 6,016,017
109 6,016,018
6,016,019
125 6,016,020

CLASS 310

12 6,016,021
75 C 6,016,022
341 6,016,023
345 6,016,024
369 6,016,025

CLASS 312

223.2 6,015,195
6,015,196
223.6 6,015,197
235.1 6,015,198
334.8 6,015,199

CLASS 313

346 R 6,016,026
356 6,016,027
402 6,016,028
6,016,029
414 6,016,030
493 6,016,031
6,016,032
506 6,016,033
553 6,016,034

CLASS 315

82 6,016,035
111.71 6,016,036
169.3 6,016,037
291 6,016,038

CLASS 318

115 6,016,039
116 6,016,040
245 6,016,041
430 6,016,042
606 6,016,043
696 6,016,044

CLASS 320

107 6,016,045
108 6,016,046
137 6,016,047
153 6,016,048
167 6,016,049

CLASS 323

315 6,016,050
6,016,051
355 6,016,052

CLASS 324

96 6,016,053
142 6,016,054
165 6,016,055
6,016,056
309 6,016,057
543 6,016,058
556 6,016,059
757 6,016,060
762 6,016,061
769 6,016,062

CLASS 326

81 6,016,063
121 6,016,064
6,016,065

CLASS 327

23 6,016,066
94 6,016,067
142 6,016,068
156 6,016,069
176 6,016,070
294 6,016,071
535 6,016,072
536 6,016,073
541 6,016,074

CLASS 330

10 6,016,075
149 6,016,076
252 6,016,077
253 6,016,078
255 6,016,079

CLASS 331

25 6,016,080
48 6,016,081
117 FE 6,016,082

CLASS 333

12 6,016,083
6,016,084
22 R 6,016,085
109 6,016,086
116 6,016,087
147 6,016,088
181 6,016,089
202 6,016,090
6,016,091
262 6,016,092

CLASS 335

210 6,016,093
216 6,016,094

CLASS 336

175 6,016,095

CLASS 337

123 6,016,096

CLASS 338

47 6,016,097
160 6,016,098

CLASS 340

321 6,016,099
384.2 6,016,100
432 6,016,101
442 6,016,102
575 6,016,103
646 6,016,104
664 6,016,105
825.31 RE. 36,505
825.44 6,016,106
6,016,107
825.72 6,016,108
941 6,016,109
995 6,016,110

CLASS 341

55 6,016,111
118 6,016,112
131 6,016,113
143 6,016,114
161 6,016,115

CLASS 342

64 6,016,116
352 6,016,117
357.06 6,016,118
6,016,119
6,016,120
357.12 6,016,121
372 6,016,122
373 6,016,123
6,016,124

CLASS 343

702 6,016,125
6,016,126
731 6,016,127
741 6,016,128
753 RE. 36,506
867 6,016,129
895 6,016,130
6,016,131

CLASS 345

82 6,016,132
89 6,016,133
104 6,016,134
126 6,016,135
133 6,016,136
145 6,016,137
163 6,016,138
169 6,016,139
178 6,016,140
327 6,016,141
334 6,016,142
339 6,016,143
342 6,016,144
6,016,145
349 6,016,146
420 6,016,147
425 6,016,148
426 6,016,149
6,016,150
430 6,016,151
436 6,016,152
441 6,016,153
442 6,016,154
468 6,016,155

CLASS 347

3 6,015,200
19 6,015,201
32 6,015,202
33 6,015,203
37 6,015,204
6,015,205
43 6,015,206
6,015,207
55 6,015,208
86 6,015,209
87 6,015,210
109 6,015,211
134 6,016,156
239 6,016,157

CLASS 348

7 6,016,158
57 6,016,159
61 6,016,160
187 6,016,161
405 6,016,162
415 RE. 36,507
420 6,016,163
424 6,016,164
441 6,016,165
515 6,016,166
558 RE. 36,508
564 RE. 36,509
646 6,016,167
661 6,016,168
724 6,016,169
731 6,016,170
836 6,016,171
845.1 6,016,172

CLASS 349

25 6,016,173
43 6,016,174
58 6,016,175
84 6,016,176
98 6,016,177
117 6,016,178
128 6,016,179
156 6,016,180
6,016,181

CLASS 351

92 6,015,212
172 6,015,213

CLASS 352

37 6,016,182
100 6,016,183

CLASS 355

36 6,016,184
52 6,016,185
53 6,016,186
6,016,187
89 6,016,188
402 6,016,189

CLASS 356

43 6,016,190
70 6,016,191
229 6,016,192
244 6,016,193
337 6,016,194
342 6,016,195
345 6,016,196
6,016,197
346 6,016,198
375 6,016,199
388 6,016,200
432 6,016,201
432 T 6,016,202

CLASS 358

1.14 6,016,204
1.6 6,016,205
298 6,016,206
406 6,016,207
448 6,016,208
537 6,016,209

CLASS 359

10 6,016,210
117 6,016,211
124 6,016,212
177 6,016,213
237 6,016,214
272 6,016,215
285 6,016,216
292 6,016,217
341 6,016,218
6,016,219
6,016,220
351 6,015,214
529 6,016,221
557 6,016,222
571 6,016,223
577 6,016,224
619 6,016,225
6,016,226
661 6,016,227
668 6,016,228
687 6,016,229
784 6,016,230
819 6,016,231
824 6,015,215
864 6,016,232
886

CLASS 360

15 6,016,233
75 6,016,234
85 6,016,235
96.5 6,016,236
97.01 6,016,237
99.08 6,016,238
104 6,016,239
105 6,016,240
113 6,016,241
119 6,016,242
127 6,016,243

CLASS 361

50 6,016,244
86 6,016,245
220 6,016,246
602 6,016,247
683 6,016,248
685 6,016,249
695 6,016,250
699 6,016,251
724 6,016,252
735 6,016,253
769 6,016,254
807 6,016,255
813 6,016,256

CLASS 362

96 6,015,216
103 6,015,217
249 6,015,218
267 6,015,219
303 6,015,220
427 6,015,221
490 6,015,222
503 6,015,223

CLASS 363

17 6,016,257
6,016,258
20 6,016,259
21 6,016,260
6,016,261
67 6,016,262

CLASS 364

479.01 RE. 36,510
710.08 6,015,224

CLASS 365

51 6,016,263
96 6,016,264
6,016,265
145 6,016,266
6,016,267
149 6,016,268
171 6,016,269
185.11 6,016,270
185.18 6,016,271
185.21 6,016,272
185.22 6,016,273
185.29 6,016,274
6,016,275
189.07 6,016,276
189.09 6,016,277
200 6,016,278
203 6,016,279
226 6,016,280
230.06 6,016,281
233 6,016,282
6,016,283
233.5 6,016,284

CLASS 366

6 6,015,225
79 6,015,226
81 6,015,227
186 6,015,228
336 6,015,229

CLASS 367

11 6,016,285
17 6,016,286
72 6,016,287
85 6,016,288

CLASS 368
203 6,016,289

CLASS 369
13 6,016,290
36 6,016,291
44.15 6,016,292
44.25 6,016,293
44.36 6,016,294
49 6,016,295
50 6,016,296
54 6,016,297
75.1 6,016,298
75.2 6,016,299
77.1 RE. 36,511
103 6,016,300
112 6,016,301
275.4 6,016,302
283 6,016,303

CLASS 370
206 6,016,304
234 6,016,305
235 6,016,306
238 6,016,307
252 6,016,308
6,016,309
255 6,016,310
280 6,016,311
311 6,016,312
330 6,016,313
337 6,016,314
378 6,016,315
389 6,016,316
391 6,016,317
401 6,016,318
410 6,016,319
442 6,016,320
458 6,016,321
508 6,016,322

CLASS 372
20 6,016,323
25 6,016,324
38 6,016,325
44 6,016,326

CLASS 374
1 6,015,230
102 6,015,231
138 6,015,232
153 6,015,233
164 6,015,234

CLASS 375
243 6,016,327
272 6,016,328
340 6,016,329
341 6,016,330
371 6,016,331
376 6,016,332

CLASS 378
4 6,016,333

CLASS 379
15 6,016,334
67 6,016,335
88.23 6,016,336
92.02 6,016,337
93.13 6,016,338
106.07 6,016,339
114 6,016,340
142 6,016,341
209 6,016,342
242 6,016,343
260 6,016,344
265 6,016,345
420 6,016,346
430 6,016,347

CLASS 380
5 6,016,348
23 6,016,349
49 6,016,350

CLASS 381
77 6,016,351
94.5 6,016,352
342 6,016,353
396 RE. 36,512

CLASS 382
117 6,016,354
124 6,016,355
132 6,016,356
144 6,016,357
151 6,016,358
162 6,016,359
166 6,016,360
209 6,016,361
232 6,016,362
6,016,363
6,016,364
233 6,016,365
260 6,016,366
275 6,016,367
291 6,016,368
298 6,016,369
299 6,016,370

CLASS 383
109 6,015,235

CLASS 384
276 6,015,236
475 6,015,237
565 6,015,238

CLASS 385
10 6,016,371
12 6,016,372
24 6,016,373
6,016,374
37 6,016,375
92 6,015,239
116 6,016,376
135 6,016,377
6,016,378
144 RE. 36,513
147 6,016,379

CLASS 386
52 6,016,380
95 6,016,381
109 6,016,382

CLASS 392
416 6,016,383

CLASS 395
23 6,016,384
80 6,016,385
114 6,016,386
115 6,016,387
200.72 6,016,388
500.01 6,016,389
500.18 6,016,390
500.22 6,016,391
682 6,016,392
683 6,016,393
701 6,016,394
705 6,016,395
706 6,016,396
6,016,397
709 6,016,398
6,016,399
712 6,016,400
800.29 6,016,401
828 6,016,402
877 6,016,403

CLASS 396
6 6,016,404
55 6,016,405
200 6,016,406
302 6,016,407

CLASS 399
27 6,016,408
33 6,016,409
69 6,016,410
103 6,016,411
111 6,016,412
113 6,016,413
159 6,016,414
162 6,016,415
167 6,016,416
308 6,016,417
314 6,016,418
390 6,016,419
397 6,016,420

CLASS 400
241 6,015,240
578 6,015,241

CLASS 401
201 6,015,242

CLASS 404
38 6,015,243

CLASS 405
22 6,015,244
200 6,015,245

CLASS 406
184 6,015,246

CLASS 408
1 R 6,015,247
204 6,015,248

CLASS 409
186 6,015,249

CLASS 410
100 6,015,250

CLASS 411
252 6,015,251
387.1 6,015,252
432 6,015,253

CLASS 414
447 6,015,254
607 6,015,255
678 6,015,256
788 6,015,257

CLASS 415
4.4 6,015,258
166 6,015,259
169.002 6,015,260

CLASS 416
62 6,015,261
100 6,015,262
110 RE. 36,514
132 A 6,015,263
146 A 6,015,264
247 R 6,015,265

CLASS 417
53 6,015,266
54 6,015,267
63 6,015,268
222.2 6,015,269
259 6,015,270
321 6,015,271
356 6,015,272
417 6,015,273
423.1 6,015,274
423.12 6,015,275
423.14 6,015,276

CLASS 418
55.4 6,015,277
82 6,015,278
259 6,015,279

CLASS 422
28 6,015,529
37 6,015,530
58 6,015,531
64 6,015,532
83 6,015,533
102 6,015,534

CLASS 423
179 6,015,535
210 6,015,536
360 6,015,537
592 6,015,538
625 6,015,539
659 6,015,540

CLASS 424
1.25 6,015,541
1.49 6,015,542
1.81 6,015,543
1.85 6,015,544
9.36 6,015,545
9.52 6,015,546
49 6,015,547
59 6,015,548
61 6,015,549
76.1 6,015,550
78.08 6,015,551
85.1 6,015,552
93.462 6,015,553
93.7 6,015,554
133.1 6,015,555
134.1 6,015,556
6,015,557
142.1 6,015,558
144.1 6,015,559
150.1 6,015,560
155.1 6,015,561
181.1 6,015,562
184.1 6,015,563
208.1 6,015,564
229.1 6,015,565
6,015,566
277.1 6,015,567
401 6,015,568
6,015,569
403 6,015,570
408 6,015,571
424 6,015,572
443 6,015,573
450 6,015,574
6,015,575
6,015,576
451 6,015,577
464 6,015,578
489 RE. 36,515

CLASS 425
116 6,015,280
226 6,015,281
233 6,015,282
381 B1 505,609
556 6,015,283
587 6,015,284

CLASS 426
36 6,015,579
281 6,015,580
282 6,015,581
392 6,015,582
396 6,015,583
417 RE. 36,516
502 6,015,584

CLASS 427
8 6,015,585
11 6,015,586
64 6,015,587
77 6,015,588
132 RE. 36,517
152 6,015,589
255.23 6,015,590
6,015,591
376.2 6,015,592
379 6,015,593
398.1 6,015,594
446 6,015,595
489 6,015,596
577 6,015,597

CLASS 428
7 6,015,598
34.4 6,015,599
34.9 6,015,600
35.8 6,015,601
141 6,015,602
195 6,015,603
6,015,604
6,015,605
214 6,015,606
6,015,607
304.4 6,015,608
308.4 6,015,609
315.7 6,015,610
326 6,015,611
6,015,612
332 6,015,613
335 6,015,614
352 6,015,615
364 6,015,616
6,015,617
373 6,015,618
410 6,015,619
411.1 6,015,620
6,015,621
426 6,015,622
447 6,015,623
500 6,015,624
6,015,625
516 6,015,626
553 6,015,627
623 6,015,628
625 6,015,629
632 6,015,630
690 6,015,631
692 6,015,632

CLASS 429
13 6,015,633
17 6,015,634
42 6,015,635
229 6,015,636
231.1 6,015,637
307 6,015,638
6,015,639

CLASS 430
5 6,015,640
6,015,641
6,015,642
6,015,643
30 6,015,644
59 6,015,645
83 6,015,646
110 6,015,647
137 6,015,648
193 6,015,649
314 6,015,650
315 6,015,651
6,015,652
393 6,015,653
504 6,015,654
512 6,015,655
531 6,015,656
554 6,015,657
557 6,015,658

CLASS 431
7 6,015,285
130 6,015,286
338 6,015,287

CLASS 432
212 6,015,288

CLASS 433
3 6,015,289
29 6,015,290
57 6,015,291
102 6,015,292
141 6,015,293
173 6,015,294

CLASS 434
106 6,015,295
301 6,015,296
322 6,015,297

CLASS 435
1.2 6,015,659
5 6,015,660
6,015,661
6,015,662
6,015,663
6,015,664
6 6,015,665
6,015,666
6,015,667
6,015,668
6,015,669
6,015,670
6,015,671
6,015,672
6,015,673
6,015,674
6,015,675
6,015,676
6,015,677
6,015,678
7.1 6,015,679
7.23 6,015,680
7.32 6,015,681
15 6,015,682
24 6,015,683
67 6,015,684
69.1 6,015,685
6,015,686
6,015,687
6,015,688
6,015,689
69.3 6,015,690
69.6 6,015,691
69.8 6,015,692
87 6,015,693
106 6,015,694
161 6,015,695
183 6,015,696
193 6,015,697
6,015,698
6,015,699
6,015,700
6,015,701
6,015,702
209 6,015,703
232 6,015,704
252.1 6,015,705
6,015,706
263 6,015,707
325 6,015,708
366 6,015,709
375 6,015,710
6,015,711
6,015,712
378 6,015,713

CLASS 436
2 6,015,714
166 6,015,715
901 6,015,716

CLASS 438
16 6,015,717
17 6,015,718
29 6,015,719
30 6,015,720
91 6,015,721
108 6,015,722
123 6,015,723
151 6,015,724
156 6,015,725
202 6,015,726
218 6,015,727
238 6,015,728
239 6,015,729
241 6,015,730
243 6,015,731
253 6,015,732
6,015,733
6,015,734
254 6,015,735
264 6,015,736
270 6,015,737
275 6,015,738
287 6,015,739
300 6,015,740
305 6,015,741
381 6,015,742
398 6,015,743
401 6,015,744
405 6,015,745
421 6,015,746
586 RE. 36,518
6,015,747
592 6,015,748
628 6,015,749
636 6,015,750
637 6,015,751
655 6,015,752
682 6,015,753
692 6,015,754
6,015,755
695 6,015,756
697 6,015,757
706 6,015,758
707 6,015,759
714 6,015,760
727 6,015,761
788 6,015,762

CLASS 439
24 6,015,298
60 6,015,299
61 6,015,300
73 6,015,301
76.2 6,015,302
107 6,015,303
108 6,015,304
135 6,015,305
139 6,015,306
6,015,307
155 6,015,308
159 6,015,309
260 6,015,310
267 6,015,311
417 6,015,312
419 6,015,313
517 6,015,314
578 6,015,315
736 6,015,316

CLASS 440
1 6,015,317
61 6,015,318
84 6,015,319
88 6,015,320
6,015,321

CLASS 442
123 6,015,763
370 6,015,764

CLASS 445
7 6,015,322
24 6,015,323
6,015,324
28 6,015,325
52 6,015,326

CLASS 446
15 6,015,327
72 6,015,328
424 6,015,329
437 6,015,330

CLASS 450
37 6,015,331
57 6,015,332

CLASS 451
8 6,015,333
28 6,015,334
72 6,015,335
251 6,015,336
288 6,015,337
541 6,015,338

CLASS 452
187 6,015,339

CLASS 454
69 6,015,340
307 6,015,341
316 6,015,342
365 6,015,343

CLASS 455
63 6,016,421
76 6,016,422
90 6,016,423
414 6,016,424
422 6,016,425
6,016,426
434 6,016,427
435 6,016,428
446 6,016,429
515 6,016,430
550 6,016,431
557 6,016,432

CLASS 463
16 6,015,344
6,015,345
20 6,015,346
27 6,015,347
42 6,015,348

CLASS 464
31 6,015,349
162 6,015,350

CLASS 470
10 6,015,351

CLASS 473
172 6,015,352
236 6,015,353
256 6,015,354
314 6,015,355
373 6,015,356
583 6,015,357
595 6,015,358

CLASS 474
18 6,015,359
80 6,015,360

CLASS 475
230 6,015,361
231 6,015,362
281 6,015,363

CLASS 477
97 6,015,364
103 6,015,365
109 6,015,366

CLASS 482
5 6,015,367
54 6,015,368
96 6,015,369
97 6,015,370
129 6,015,371
137 6,015,372

CLASS 493
196 6,015,373
464 6,015,374

CLASS 494

27 6,015,375

CLASS 501

40 6,015,765

CLASS 502

103 6,015,766
152 6,015,767
300 6,015,768
331 6,015,769

CLASS 503

201 6,015,770
209 6,015,771
227 RE. 36,519
6,015,772

CLASS 504

116 6,015,773
221 6,015,774

CLASS 505

190 6,016,433
210 6,016,434

CLASS 508

103 6,015,775
192 6,015,776
208 6,015,777
394 6,015,778
591 6,015,779

CLASS 510

237 6,015,780
302 6,015,781
379 6,015,782
392 6,015,783
446 6,015,784

CLASS 514

2 6,015,785
12 6,015,786
6,015,787
6,015,788
15 6,015,789
17 6,015,790
18 6,015,791
19 6,015,792
23 6,015,793
44 6,015,794
6,015,795
45 6,015,796
46 6,015,797
57 6,015,798
58 6,015,799
85 6,015,800
108 6,015,801
141 6,015,802
152 6,015,803
6,015,804
176 6,015,805
178 6,015,806
183 6,015,807
192 6,015,808
210 6,015,809
220 6,015,810
227.5 6,015,811
235.8 6,015,812
256 6,015,813
259 6,015,814
291 6,015,815
299 6,015,816
301 6,015,817
312 6,015,818
318 6,015,819
348 6,015,820
355 6,015,821
357 6,015,822
374 6,015,823
375 6,015,824
383 6,015,825
394 6,015,826
397 6,015,827
404 6,015,828
419 6,015,829
445 6,015,830
546 6,015,831
548 6,015,832
558 RE. 36,520
561 6,015,833
562 6,015,834
642 6,015,835
653 6,015,836
777 6,015,837
B1 525,634

CLASS 516

12 6,015,838
134 6,015,839
270 6,015,840

CLASS 522

29 6,015,841
64 6,015,842
84 6,015,843

CLASS 523

113 6,015,844
130 6,015,845
142 6,015,846
160 6,015,847
427 6,015,848

CLASS 524

100 6,015,849
188 6,015,850
243 6,015,851
251 6,015,852
303 6,015,853
396 6,015,854
442 6,015,855
451 6,015,856
6,015,857
545 6,015,858

CLASS 525

112 6,015,859
123 6,015,860
232 6,015,861
320 6,015,862
333.7 6,015,863
385 6,015,864
524 6,015,865

CLASS 526

101 6,015,866
124.9 6,015,867
127 6,015,868

CLASS 528

15 6,015,869
30 6,015,870
48 6,015,871
102 6,015,872
157 6,015,873
391 6,015,874
501 6,015,875

CLASS 530

300 6,015,876
326 6,015,877
329 6,015,878
331 6,015,879
333 6,015,880
339 6,015,881
350 6,015,882
351 6,015,883
387.3 6,015,884

CLASS 534

637 6,015,885

CLASS 536

23.1 6,015,886
6,015,887
23.5 6,015,888
6,015,889
23.7 6,015,890
23.71 6,015,891
24.5 6,015,892
6,015,893
6,015,894
25.3 6,015,895

CLASS 540

134 6,015,896
474 6,015,897
554 6,015,898

CLASS 544

171 6,015,899
380 6,015,900

CLASS 546

89 6,015,901
105 6,015,902
147 6,015,903
278.7 6,015,904
288 6,015,905
321 6,015,906
329 6,015,907

CLASS 548

207 6,015,908
243 6,015,909
367.7 6,015,910
369.4 6,015,911
408 6,015,912

CLASS 549

386 6,015,913
510 6,015,914

CLASS 554

184 6,015,915

CLASS 556

7 6,015,916
12 6,015,917
117 6,015,918
145 6,015,919
479 6,015,920

CLASS 560

36 6,015,921
312 6,015,922

CLASS 562

519 6,015,923
524 6,015,924

CLASS 564

316 6,015,925
442 6,015,926

CLASS 568

362 6,015,927
882 6,015,928

CLASS 585

15 6,015,929
320 6,015,930
649 6,015,931
751 6,015,932
810 6,015,933

CLASS 586

23.1 6,015,376

CLASS 600

9 6,015,377
37 6,015,378
39 6,015,379
40 6,015,380
104 6,015,381
207 6,015,382
316 6,016,435
374 6,016,436
6,016,437
410 6,016,438
411 6,016,439
437 6,015,383
440 6,015,384
443 6,015,385
473 6,016,440
477 6,016,441
486 6,015,386
504 6,015,387
518 6,016,442
519 6,016,443
529 6,015,388
533 6,015,389
544 6,016,444
547 6,016,445
549 6,015,390
567 6,015,391
583 6,015,392
587 6,015,393

CLASS 601

55 6,015,394

CLASS 602

19 6,015,395

CLASS 604

192 6,015,396
6,015,397
272 6,015,398
332 6,015,399
358 6,015,934
378 6,015,935
383 6,015,936
506 6,015,400
6,015,401
523 6,015,402

CLASS 606

4 6,015,403
9 6,015,404
16 6,015,405
41 6,015,406
6,015,407
53 6,015,408
61 6,015,409
73 6,015,410
80 6,015,411
83 6,015,412
104 6,015,413
108 6,015,414
113 6,015,415
144 6,015,416
151 6,015,417
167 6,015,418
6,015,419
168 6,015,420
190 6,015,421
191 6,015,422
198 6,015,423
200 6,015,424
204.45 6,015,425
205 6,015,426
232 6,015,427
6,015,428

CLASS 607

13 6,016,446
27 6,016,447
29 6,016,448
45 6,016,449
50 6,016,450
75 6,016,451
101 6,016,452

CLASS 623

1 6,015,429
6,015,430
6,015,431
6,015,432
6,015,433
3 6,015,434
6 6,015,435
16 6,015,937
17 6,015,436
19 6,015,437
38 RE. 36,521

CLASS 624

195 6,015,438

CLASS 701

21 6,016,453
37 6,016,454
50 6,016,455
55 6,016,456
70 6,016,457
93 6,016,458
102 6,016,459
6,016,460

CLASS 702

6 6,016,461
14 6,016,462
69 6,016,463
79 6,016,464
116 6,016,465
187 6,016,466

CLASS 704

9 6,016,467
220 6,016,468
222 6,016,469
244 6,016,470
266 6,016,471
500 6,016,472
6,016,473

CLASS 705

1 6,016,474
6,016,475
6,016,476
7 6,016,477
9 6,016,478
19 6,016,479
21 6,016,480
28 6,016,481
35 6,016,482
37 6,016,483
39 6,016,484
400 6,016,485

CLASS 706

47 6,016,486

CLASS 707

2 6,016,487
4 6,016,488
8 6,016,489
6,016,490
9 6,016,491
100 6,016,492
101 6,016,493
102 6,016,494
103 6,016,495
6,016,496
6,016,497
6,016,498
104 6,016,499
202 6,016,500
203 6,016,501
509 6,016,502

CLASS 709

104 6,016,503
200 6,016,504
205 6,016,505
217 6,016,506
6,016,507
223 6,016,508
224 6,016,509
233 6,016,510
236 6,016,511
245 6,016,512
250 6,016,513
300 6,016,514
301 6,016,515
304 6,016,516

CLASS 710

1 6,016,517
8 6,016,518
19 RE. 36,522
6,016,519
33 6,016,520
34 6,016,521
52 6,016,522
63 6,016,523
65 6,016,524
100 6,016,525
105 6,016,526
117 6,016,527
243 6,016,528

CLASS 711

3 6,016,529
6 6,016,530
118 6,016,531
6,016,532
128 6,016,533
154 6,016,534
171 6,016,535
173 6,016,536
211 6,016,537

CLASS 712

32 6,016,538
200 6,016,539
214 6,016,540
217 6,016,541
225 6,016,542
233 6,016,543
234 6,016,544
238 6,016,545

CLASS 713

200 6,016,546
300 6,016,547
323 6,016,548
324 6,016,549
400 6,016,550
601 6,016,551

CLASS 714

6 6,016,552
21 6,016,553
25 6,016,554
35 6,016,555
38 6,016,556
6,016,557
45 6,016,558
48 6,016,559
718 6,016,560
720 6,016,561
724 6,016,562
725 6,016,563
726 6,016,564
736 6,016,565
6,016,566
748 6,016,567
792 6,016,568

CLASS 800

18 6,015,938
278 6,015,939
279 6,015,940
6,015,941
280 6,015,942
298 6,015,943
320.1 6,015,944

CLASSIFICATION OF DESIGNS

D1— 105 418,963
120 418,964
D2— 500 418,965
712 418,966
946 418,967
962 418,968
980 418,969
D3— 5 418,970
207 418,971
217 418,972
218 418,973
226 418,974
238 418,975
243 418,976
273 418,977
418,978
D4— 104 418,979
418,980
418,981
418,982
D5— 53 418,983
D6— 314 418,984
319 418,985
334 418,986
335 418,987
337 418,988
418,989
367 418,990
381 418,991
418,992
418,993
418,994
385 418,995
403 418,996
429 418,997
458 418,998
480 418,999
481 419,000
486 419,001
419,002
487 419,003
492 419,004
495 419,005
500 419,006
502 419,007
419,008
515 419,009
419,010
519 419,011
520 419,012
522 419,013
419,014
419,015
523 419,016
419,017
534 419,018
551 419,019
562 419,020
574 419,021
580 419,022
601 419,023
419,024
611 419,025
630 419,026
D7— 319 419,027
321 419,028
392 419,029
393 419,030
395 419,031
515 419,032
609 419,033
628 419,034
649 419,035
667 419,036
672 419,037
679 419,038
681 419,039
419,040
688 419,041
D8— 1 419,042
5 419,043
30 419,044
51 419,045
419,046
57 419,047
68 419,048
105 419,049
419,050
313 419,051
336 419,052
339 419,053
382 419,054
419,055
499 419,056
D9— 302 419,057
307 419,058
314 419,059
317 419,060
333 419,061
346 419,062
415 419,063
419,064
418 419,065
423 419,066
430 419,067
436 419,068
443 419,069
449 419,070
453 419,071
517 419,072
520 419,073
523 419,074
529 419,075
533 419,076

	563	419,077		129	419,113			419,148		56	419,183		238	419,218			419,253
D10—	30	419,078		143	419,114		116	419,149	D19—	1	419,184		243	419,219		49	419,254
	31	419,079		146	419,115		117.3	419,150			419,185		252	419,220		65	419,255
	70	419,080		147	419,116		121	419,151		27	419,186		254	419,221		67	419,256
	72	419,081			419,117			419,152		36	419,187		255	419,222			419,257
	78	419,082			419,118		124	419,153			419,188			419,223		87	419,258
	79	419,083			419,119		137	419,154		51	419,189		262	419,224	D27—	175	419,259
	85	419,084		160	419,120		138	419,155		52	419,190		280.2	419,225		188	419,260
	86	419,085		162	419,121		188	419,156		61	419,191		296	419,226	D28—	8.1	419,261
	91	419,086			419,122		192	419,157		78	419,192		304	419,227			419,262
	94	419,087		178	419,123		214	419,158	D20—	4	419,193		311	419,228		22	419,263
	96	419,088		196	419,124		230	419,159		14	419,194		325	419,229		25	419,264
	97	419,089			419,125		253	419,160		19	419,195		333	419,230		48	419,265
	101	419,090		209	419,126	D15—	7	419,161		35	419,196		365	419,231		89	419,266
		419,091			419,127		9	419,162		44	419,197		413	419,232			
	104	419,092		302	419,128		14	419,163	D21—	332	419,198	D24—	105	419,233	D29—	100	419,267
	106	419,093		411	419,129		31	419,164			419,199		107	419,234	D30—	119	419,268
		419,094		421	419,130		127	419,165			419,200			419,235		139	419,269
	108	419,095	D13—	103	419,131	D16—	101	419,166		370	419,201		114	419,236		145	419,270
	109	419,096		104	419,132			419,167		371	419,202		130	419,237		152	419,271
	114	419,097		120	419,133		131	419,168		401	419,203		152	419,238	D32—	25	419,272
	116	419,098		146	419,134		202	419,169			419,204		188	419,239		57	419,273
	120	419,099		147	419,135		208	419,170		447	419,205		194	419,240		70	419,274
	121	419,100			419,136		218	419,171		483	419,206		234	419,241			
	132	419,101		423	419,137		231	419,172		549	419,207	D25—	35	419,242	D34—	38	419,275
D11—	26	419,102	D14—	106	419,138		321	419,173		627	419,208		68	419,243	D99—	35	419,277
	90	419,103		107	419,139			419,174		658	419,209		124	419,244			
		419,104			419,140			419,175		684	419,210			419,245			
	184	419,105		113	419,141		326	419,176		705	419,211		138	419,246			
	218	419,106			419,142		336	419,177		716	419,212	D26—	1	419,247			
D12—	86	419,107		114.1	419,143	D18—	15	419,178		744	419,213		28	419,248			
	88	419,108			419,144			419,179		750	419,214			419,249			
	91	419,109			419,145		17	419,180	D23—	209	419,215			419,250			
	111	419,110		114.3	419,146		40	419,181		233	419,216		38	419,251			
		419,111		115	419,147		43	419,182		237	419,217			419,252			

CLASSIFICATION OF PLANTS

P.—	133	11,184		162	11,182		208	11,183		389	11,181								

GEOGRAPHICAL INDEX

OF RESIDENCES OF INVENTORS

(U.S. States, Territories and Armed Forces, and the Commonwealth of Puerto Rico)

Alabama 1
Alaska 2
American Samoa 3
Arizona 4
Arkansas 5
California 6
Collective Indicator for Marshall Islands, Federated States of Micronesia, and U.S. Minor Outlying Islands 7
Colorado 8
Connecticut 9
Delaware 10
District of Columbia 11
Florida 12
Georgia 13
Guam 14
Hawaii 15
Idaho 16
Illinois 17
Indiana 18
Iowa 19
Kansas 20
Kentucky 21
Louisiana 22
Maine 23
Maryland 24
Massachusetts 25
Michigan 26
Minnesota 27
Mississippi 28
Missouri 29
Montana 30
Nebraska 31
Nevada 32
New Hampshire 33
New Jersey 34
New Mexico 35
New York 36
North Carolina 37
North Dakota 38
Ohio 39
Oklahoma 40
Oregon 41
Pennsylvania 42
Puerto Rico 43
Rhode Island 44
South Carolina 45
South Dakota 46
Tennessee 47
Texas 48
Utah 49
Vermont 50
Virginia 51
Virgin Islands 52
Washington 53
West Virginia 54
Wisconsin 55
Wyoming 56
U.S. Air Force 57
U.S. Army 58
U.S. Navy 59
U.S. Coast Guard 60
U.S. Marine Corps 61

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 6,015,401
6,015,417
6,016,392
04 : 6,014,826
6,014,898
6,014,948
6,014,972
6,015,065
6,015,080
6,015,149
6,015,177
6,015,230
6,015,270
6,016,006
6,016,019
6,016,122
6,016,173
6,016,269
6,016,315
6,016,326
6,016,528
05 : 6,015,049
6,016,335
06 : RE. 36,498
RE. 36,503
RE. 36,506
6,014,773
6,014,778
6,014,779
6,014,780
6,014,784
6,014,823
6,014,831
6,014,837
6,014,890
6,014,904
6,014,911
6,014,916
6,014,922
6,014,927
6,014,935
6,014,941
6,014,944
6,014,969
6,014,970
6,014,973
6,014,976
6,014,987
6,014,999
6,015,024
6,015,056
6,015,058
6,015,077
6,015,102
6,015,116
6,015,127
6,015,128
6,015,136
6,015,143
6,015,161
6,015,196
6,015,207
6,015,225
6,015,232
6,015,253
6,015,261
6,015,268
6,015,280
6,015,285
6,015,289
6,015,295
6,015,315
6,015,330
6,015,332
6,015,343
6,015,344
6,015,351
6,015,353
6,015,369
6,015,384
6,015,385
6,015,392
6,015,397
6,015,402
6,015,407
6,015,410
6,015,414
6,015,421
6,015,424
6,015,427
6,015,429
6,015,431
6,015,433
6,015,451
6,015,457
6,015,465
6,015,473
6,015,474
6,015,476
6,015,477
6,015,479
6,015,492
6,015,493
6,015,502
6,015,528
6,015,529
6,015,540
6,015,548
6,015,553
6,015,554
6,015,557
6,015,567
6,015,571
6,015,573
6,015,584
6,015,591
6,015,595
6,015,599
6,015,600
6,015,638
6,015,640
6,015,659
6,015,660
6,015,667
6,015,672
6,015,674
6,015,676
6,015,678
6,015,686
6,015,687
6,015,694
6,015,702
6,015,708
6,015,712
6,015,717
6,015,719
6,015,727
6,015,732
6,015,736
6,015,738
6,015,740
6,015,747
6,015,752
6,015,759
6,015,761
6,015,776
6,015,783
6,015,786
6,015,788
6,015,808
6,015,819
6,015,831
6,015,843
6,015,879
6,015,880
6,015,882
6,015,883
6,015,887
6,015,892
6,015,894
6,015,930
6,015,938
6,015,942
6,015,958
6,015,969
6,015,980
6,015,999
6,016,000
6,016,009
6,016,011
6,016,012
6,016,020
6,016,021
6,016,039
6,016,044
6,016,051
6,016,063
6,016,066
6,016,072
6,016,082
6,016,092
6,016,101
6,016,114
6,016,118
6,016,119
6,016,120
6,016,131
6,016,138
6,016,142
6,016,144
6,016,149
6,016,151
6,016,185
6,016,207
6,016,210
6,016,213
6,016,216
6,016,220
6,016,230
6,016,241
6,016,250
6,016,268
6,016,270
6,016,285
6,016,290
6,016,295
6,016,308
6,016,310
6,016,311
6,016,316
6,016,322
6,016,323
6,016,324
6,016,325
6,016,330
6,016,344
6,016,347
6,016,354
6,016,355
6,016,360
6,016,366
6,016,371
6,016,383
6,016,385
6,016,390
6,016,393
6,016,394
6,016,395
6,016,398
6,016,399
6,016,401
6,016,421
6,016,437
6,016,445
6,016,455
6,016,463
6,016,471
6,016,473
6,016,474
6,016,478
6,016,479
6,016,484
6,016,485
6,016,489
6,016,493
6,016,513
6,016,522
6,016,524
6,016,530
6,016,532
6,016,539
6,016,540
6,016,542
6,016,561
6,016,563
6,016,568
08 : 6,014,792
6,014,822
6,014,891
6,015,087
6,015,165
6,015,239
6,015,305
6,015,572
6,015,791
6,015,798
6,015,916
6,016,034
6,016,081
6,016,141
6,016,143
6,016,211
6,016,240
6,016,483
09 : 6,014,918
6,014,931
6,015,167
6,015,264
6,015,303
6,015,485
6,015,488
6,015,512
6,015,534
6,015,608
6,015,630
6,015,634
6,015,900
6,015,917
6,015,957
6,015,965
6,016,191
6,016,205
6,016,267
6,016,426
6,016,476
6,016,481
10 : RE. 36,516
6,015,480
6,015,510
6,015,773
6,015,912
6,015,923
B1 574,260
12 : RE. 36,501
6,014,828
6,014,833
6,015,002
6,015,007
6,015,070
6,015,086
6,015,092
6,015,123
6,015,132
6,015,137
6,015,180
6,015,191
6,015,227
6,015,233
6,015,244
6,015,327
6,015,331
6,015,333
6,015,352
6,015,372
6,015,388
6,015,415
6,015,443
6,015,530
6,015,541
6,015,579

6,015,707
6,015,763
6,015,970
6,016,107
6,016,136
6,016,193
6,016,225
6,016,256
6,016,307
6,016,372
6,016,535
13 : 6,014,843
6,014,870
6,015,039
6,015,051
6,015,250
6,015,341
6,015,430
6,015,496
6,015,701
6,015,764
6,015,891
6,015,956
6,016,163
6,016,427
15 : 6,015,939
16 : RE. 36,518
6,014,797
6,014,901
6,014,993
6,015,046
6,015,060
6,015,079
6,015,188
6,015,323
6,015,418
6,015,729
6,015,743
6,015,760
6,015,977
6,015,983
6,015,986
6,015,997
6,016,004
6,016,010
6,016,060
6,016,282
17 : RE. 36,499
6,014,795
6,014,810
6,014,813
6,014,829
6,014,852
6,014,861
6,014,950
6,014,956
6,014,960
6,015,069
6,015,073
6,015,129
6,015,197
6,015,214
6,015,255
6,015,263
6,015,293
6,015,299
6,015,322
6,015,365
6,015,395
6,015,423
6,015,506
6,015,533
6,015,662
6,015,681
6,015,815
6,015,902
6,015,932
6,015,933
6,016,027
6,016,105
6,016,214
6,016,312
6,016,345
6,016,346
6,016,422
6,016,459
6,016,486
6,016,557
18 : 6,014,900
6,014,951
6,015,222
6,015,223
6,015,252
6,015,394
6,015,499
6,015,671
6,015,807
6,015,826
6,015,911
6,016,045
6,016,054
6,016,348
19 : 6,014,844
6,014,996
6,015,005
6,015,218
6,015,663
6,015,941
6,015,944
6,016,121
6,016,343
6,016,389
20 : 6,014,835
6,014,848
6,015,016
6,015,074
6,015,409
6,016,525
6,016,527
21 : 6,015,190
6,015,206
6,015,376
22 : 6,014,783
6,014,785
6,014,864
6,014,933
6,014,966
6,015,018
6,015,339
6,015,497
6,016,286
6,016,288
23 : 6,015,371
6,015,714
6,016,127
6,016,452
24 : 6,014,932
6,014,975
6,015,099
6,015,152
6,015,543
6,015,610
6,015,668
6,015,673
6,015,765
6,015,777
6,015,793
6,015,836
6,015,876
6,015,884
6,016,005
6,016,306
6,016,388
6,016,449
25 : 6,014,771
6,014,800
6,014,902
6,014,929
6,014,988
6,015,156
6,015,300
6,015,338
6,015,356
6,015,391
6,015,404
6,015,426
6,015,495
6,015,500
6,015,555
6,015,558
6,015,563
6,015,682
6,015,692
6,015,709
6,015,787
6,015,790
6,015,794
6,015,877
6,015,904
6,015,907
6,015,974
6,016,031
6,016,036
6,016,038
6,016,050
6,016,076
6,016,148
6,016,152
6,016,196
6,016,202
6,016,353
6,016,380
6,016,464
6,016,470
6,016,500
6,016,511
6,016,531
26 : RE. 36,502
RE. 36,505
6,014,788
6,014,832
6,014,840
6,014,872
6,014,876
6,014,879
6,014,884
6,014,893
6,014,899
6,014,906
6,014,908
6,014,934
6,014,936
6,014,953
6,014,961
6,015,037
6,015,063
6,015,064
6,015,071
6,015,075
6,015,097
6,015,103
6,015,111
6,015,126
6,015,133
6,015,154
6,015,175
6,015,178
6,015,182
6,015,184
6,015,187
6,015,198
6,015,228
6,015,254
6,015,277
6,015,302
6,015,366
6,015,399
6,015,444
6,015,475
6,015,516
6,015,542
6,015,588
6,015,604
6,015,665
6,015,800
6,015,832
6,015,833
6,015,858
6,015,861
6,015,868
6,015,961
6,016,049
6,016,097
6,016,102
6,016,215
6,016,460
27 : RE. 36,510
6,014,794
6,014,896
6,014,947
6,014,971
6,015,000
6,015,043
6,015,050
6,015,058
6,015,106
6,015,120
6,015,195
6,015,387
6,015,393
6,015,405
6,015,419
6,015,452
6,015,482
6,015,503
6,015,536
6,015,593
6,015,597
6,015,603
6,015,700
6,015,838
6,015,947
6,016,043
6,016,234
6,016,242
6,016,436
6,016,442
6,016,447
6,016,448
6,016,475
6,016,495
6,016,514
6,016,553
28 : 6,014,894
6,015,690
6,016,277
6,016,403
29 : RE. 36,514
6,014,817
6,014,838
6,014,841
6,015,247
6,015,403
6,015,613
6,015,785
6,015,855
6,015,940
30 : 6,014,772
6,015,368
6,015,462
6,015,963
6,016,053
31 : 6,015,440
32 : 6,014,940
6,015,576
6,015,639
33 : 6,014,830
6,015,505
6,016,246
6,016,466
6,016,467
6,016,480
6,016,529
34 : 6,014,770
6,014,775
6,014,791
6,014,851
6,015,003
6,015,053
6,015,091
6,015,160
6,015,217
6,015,283
6,015,357
6,015,358
6,015,432
6,015,481
6,015,513
6,015,524
6,015,547
6,015,644
6,015,652
6,015,766
6,015,797
6,015,801
6,015,803
6,015,898
6,015,926
6,015,929
6,016,058
6,016,067
6,016,085
6,016,160
6,016,166
6,016,212
6,016,219
6,016,305
6,016,319
6,016,327
6,016,336
6,016,338
6,016,342
6,016,373
6,016,374
6,016,376
6,016,377
6,016,482
35 : 6,015,347
6,015,494
6,016,052
36 : RE. 36,497
RE. 36,513
RE. 36,519
6,014,801
6,014,809
6,014,834
6,014,845
6,014,871
6,014,930
6,014,985
6,015,052
6,015,055
6,015,088
6,015,090
6,015,100
6,015,119
6,015,131
6,015,146
6,015,153
6,015,174
6,015,176
6,015,224
6,015,259
6,015,301
6,015,314
6,015,324
6,015,326
6,015,329
6,015,340
6,015,342
6,015,422
6,015,425
6,015,509
6,015,517
6,015,520
6,015,560
6,015,562
6,015,566
6,015,574
6,015,615
6,015,620
6,015,632
6,015,633
6,015,657
6,015,658
6,015,683
6,015,693
6,015,772
6,015,792
6,015,804
6,015,809
6,015,816
6,015,837
6,015,853
6,015,890
6,015,945
6,015,949
6,015,955
6,015,985
6,015,988
6,015,991
6,016,008
6,016,033
6,016,103
6,016,108
6,016,135
6,016,153
6,016,157
6,016,159
6,016,204
6,016,232
6,016,244
6,016,257
6,016,333
6,016,404
6,016,406
6,016,409
6,016,410
6,016,415
6,016,439
6,016,444
6,016,505
6,016,512
6,016,546
37 : 6,014,777
6,014,853
6,014,854
6,014,858
6,014,942
6,015,172
6,015,231
6,015,470
6,015,616
6,015,881
6,015,893
6,015,910
6,015,968
6,016,069
6,016,075
6,016,126
6,016,424
6,016,428
6,016,431
6,016,503
39 : 6,014,781
6,014,847
6,014,862
6,014,883
6,014,977
6,014,998
6,015,025
6,015,026
6,015,045
6,015,062
6,015,124
6,015,145
6,015,168
6,015,181
6,015,276
6,015,296
6,015,328
6,015,350
6,015,374
6,015,382
6,015,400
6,015,416
6,015,435
6,015,525
6,015,589
6,015,619
6,015,778
6,015,781
6,015,782
6,015,828
6,015,851
6,015,920
6,015,935
6,015,964
6,016,450
40 : 6,014,946
6,015,266
6,015,580
6,015,931
6,016,048
41 : 6,014,787
6,015,019
6,015,205
6,015,209
6,015,383
6,015,467
6,015,847
6,015,886
6,016,015
6,016,032
6,016,194
6,016,352
6,016,509
6,016,510
6,016,551
6,016,556
42 : RE. 36,507
RE. 36,520
6,014,776
6,014,824
6,014,827
6,014,885
6,014,917
6,014,981
6,015,042
6,015,089
6,015,104
6,015,113
6,015,242
6,015,265
6,015,272
6,015,311
6,015,313
6,015,386
6,015,484
6,015,519
6,015,535
6,015,549
6,015,561
6,015,570
6,015,716
6,015,817
6,015,852
6,015,862
6,015,871
6,015,908
6,015,913
6,015,959
6,015,998
6,016,007
6,016,096
6,016,099
6,016,472
44 : 6,016,252
6,016,453
6,016,506
45 : 6,014,820
6,014,866
6,015,041
6,015,061
6,015,335
6,015,458
6,015,583
46 : 6,015,107
6,015,158
6,016,025
47 : 6,014,850
6,014,937
6,015,047
6,015,170
6,015,185
6,015,274
6,016,100
6,016,227
48 : RE. 36,522
6,014,789
6,014,790
6,014,819
6,014,836
6,014,855
6,014,939
6,014,949
6,015,004
6,015,009
6,015,010
6,015,011
6,015,012
6,015,083
6,015,115
6,015,215
6,015,245
6,015,256
6,015,271
6,015,370
6,015,373
6,015,438
6,015,445
6,015,450
6,015,459
6,015,463
6,015,464
6,015,489
6,015,550
6,015,607
6,015,617
6,015,624
6,015,629
6,015,675
6,015,691
6,015,710
6,015,711
6,015,718
6,015,739
6,015,769
6,015,779
6,015,796
6,015,811
6,015,842
6,015,854
6,015,875
6,015,922
6,015,992
6,016,001
6,016,002
6,016,062
6,016,071
6,016,077
6,016,112
6,016,117
6,016,124
6,016,146
6,016,147
6,016,254
6,016,255
6,016,287
6,016,304
6,016,332
6,016,334
6,016,400
6,016,425
6,016,429
6,016,462
6,016,477
6,016,494
6,016,496
6,016,498
6,016,501
6,016,507
6,016,517
6,016,526
6,016,533
6,016,534
6,016,537
6,016,538
6,016,544
6,016,545
6,016,550
6,016,554

6,016,555
B1 505,609
49 : 6,014,782
6,014,839
6,014,919
6,015,085
6,015,105
6,015,163
6,016,402
6,016,499
50 : 6,015,390
6,015,745
6,015,750
6,015,993
6,016,095
6,016,137
6,016,357
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6,014,915
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6,015,771
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6,015,258

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419,230
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05 : 419,232
06 : 418,964
418,970
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08 : 419,077
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09 : 418,963
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38 : 419,107
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419,211
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42 : 419,049
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